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SLEEPING SICKNESS.

KLEINE (F. K.). **Zur Epidemiologie der Schlafkrankheit.** [The Epidemiology of Sleeping Sickness.]—*Deut. Med. Woch.* 1923. Apr. 20. Vol. 49. No. 16. pp. 505–506.

As the result of various enquiries, Kleine finds it necessary to return once more to the question of the alleged identity of the human parasite *T. rhodesiense* and *T. brucei*, the cause of disease in cattle, horses and dogs, and furthermore to the rôle which the game plays in the spread of sleeping sickness. In Kleine's opinion, the identity of *T. brucei* and *T. rhodesiense* is in no way proved and is extremely improbable. In most regions of East Africa where cattle and dogs rapidly die of nagana, human trypanosomiasis is unknown. The author thinks that BRUCE's argument that in the past blood examinations were not made and that consequently some deaths recorded as due to malaria may have been due to trypanosomiasis cannot hold of German East Africa, because under KOCH's direction blood examinations of natives and Europeans were made in great number, and also later, when it was found experimentally that *G. morsitans* could transmit *T. gambiense*, many blood examinations were made in *morsitans* areas; all these examinations were negative. TAUTE and HUBER's inoculations are also referred to [this *Bulletin*, Vol. 15, p. 35].

Some claim to probability has the view that *T. gambiense* and *T. rhodesiense* are identical and that the infection was spread eastwards from West Africa by commerce; both *G. morsitans* and *G. palpalis* have been shown experimentally to be capable of transmitting either trypanosome. Reference is made to MURRAY's statement that sleeping sickness did not occur in Nyasaland previous to 1907 or 1908, and that it was introduced from Tanganyika or Northern Rhodesia [this *Bulletin*, Vol. 19, p. 129]. In reply to BRUCE's contention that sleeping sickness in Nyasaland differs in certain respects, notably in virulence, from that found elsewhere, Kleine states that he saw no difference between that met with in Rhodesia and that in the Sese Islands. Possibly the character of the infection in Rhodesia has changed and lost its pristine virulence; the disease in the Lake Victoria region was very virulent to begin with. How the infection becomes gradually less virulent is unknown, but in Kleine's opinion this takes place as follows:— Different strains of the same trypanosome exhibit different degrees of virulence and certain strains of true *T. gambiense* produce death less rapidly than others; the less virulent strains are more likely to get

into the fly since patients with a more virulent strain keep to their huts and die sooner ; consequently, after a time, when the first virulence of the epidemic is past, the infection assumes a more chronic form. The view that the strains after passage through the fly are constant in virulence is unproved and doubtful. It is difficult to infect fly with parasites that have been a long period in the vertebrate host ; the infection takes place best from a freshly infected animal.

That the game can under natural conditions harbour the human parasite is certain, but whether the infection of the game has any significance in the spread of sleeping sickness is not yet shown. Experience in German East Africa indicated that this was not the case. On Lake Victoria the numerous cattle of the Wagaia, who suffered greatly from sleeping sickness, were not infected, although the place swarmed with *G. palpalis* ; on Tanganyika in one district where 25–80 per cent .of the population had sleeping sickness, only 3·5 per cent. of the domestic stock were infected with *T. gambiense* and the few game were free from infection. In laboratory experiments goats and sheep and antelopes were not specially susceptible to *T. gambiense.* Furthermore, sheep and goats tend to recover from the infection.

The finding of KINGHORN and YORKE that 16 per cent. of the game in the Luangwa Valley were infected with *T. rhodesiense* is certainly an error, since *T. brucei,* which is so frequently encountered in game, was not mentioned by these authors. [KINGHORN and the reviewer believe that *T. rhodesiense* and *T. brucei* are identical and consequently it matters little in this connexion whether the parasite found by them in game be called *T. brucei* or *T. rhodesiense.*] Kleine believes that *T. brucei* can only be distinguished from *T. rhodesiense* by inoculation experiments into man. There follows a reference to the statement of MAY that the infection in Rhodesia followed the movement of natives, the majority of the cases being found around the chief trade centre, where in general were fewer game than in places free of infection.

The general conclusion is that the cause of animal trypanosomiasis, viz., *T. brucei,* is not identical with that of human trypanosomiasis, viz., *T. rhodesiense.* The latter is probably identical with the trypanosome causing sleeping sickness in the Congo and around Lakes Tanganyika and Victoria. The chief reservoir of the trypanosome is man ; whether and in what manner the game play a part in the spread of the disease is unknown. [Pending further scientific observations and experimental work, it seems unnecessary to add any comment ; the matter has frequently been discussed in great detail and in the reviewer's opinion this article is a mere re-statement of Kleine's views and does not advance knowledge.]

W. Yorke.

ORPEN (R. W.). **Report on Sleeping Sickness in Eket District, Southern Nigeria.**—*Ann. Trop. Med. & Parasit.* 1923. Apr. 18. Vol. 17. No. 1. pp. 93–99. [2 refs.]

With the object of ascertaining the present position of sleeping sickness in Eket, Southern Nigeria, the author made a tour of the district during April and May, 1922. He quotes from MACFIE & GALLAGHER's report [this *Bulletin,* Vol. 5, p. 90] on sleeping sickness in the Eket district in 1913 as follows :—

" During the sixteen months in which sleeping sickness has been under investigation, two hundred and twenty-two cases have been identified

in which the trypanosomes have been demonstrated. In addition one hundred and fourteen cases have been met with presenting some of the clinical features of the disease, but in which parasites have not actually been found. There can be little doubt that the majority of these were cases of trypanosomiasis."

Unfortunately, the nominal roll of cases made by MACFIE was not available, but Orpen assumes that the 222 cases include 89 definitely *recorded* cases, lists of which, either in manuscript or typescript, were compiled in 1912 by FORAN and GRAY, with a signed statement to the effect that all had been diagnosed microscopically. Of these 89 cases, Orpen was able to trace 35, details of which are given in two tables ; 23 of them are still alive and apparently free from trypanosomiasis, and 12 are dead, 6 apparently from sleeping sickness and 6 from either influenza or smallpox.

Apart from these 35 *recorded* cases, Orpen saw at Eket 28 *unrecorded* cases whom he accepted from evidence as being former patients in the camp ; all were in good health and did not exhibit any sign of trypanosomiasis. He was informed of the deaths of 7 *unrecorded* cases who were stated to be inmates of the camp.

In an endeavour to ascertain whether trypanosomiasis is still prevalent in the Eket district, as many persons as possible were examined in the towns and villages visited. In all, 1,806 persons were examined by gland palpation. The results are set forth in a table in the manner adopted by MACFIE and GALLAGHER. On comparing Orpen's table with MACFIE and GALLAGHER's, a striking reduction is seen in the proportion of persons with enlarged glands ; only 23 cases were seen which exhibited signs suggestive of sleeping sickness, *e.g.*, enlarged glands, but gland puncture and blood examination were negative.

The article concludes with the following passage :—

" Sleeping sickness has not been demonstrated during the recent tour in Eket, although the cases selected for examination were chosen as presenting clinical signs of possible trypanosome infection. The natives themselves are of the opinion that the disease has died out, and this statement is borne out by the members of the Qua-Ibo Mission ; at the same time this must not be accepted as a definite statement, because, as already noted above, the natives are not inclined to discuss the subject, and I am strongly of the opinion that a number of possibly genuine cases were removed from villages on my approach."

W. Y.

JAMOT (E.). **Un nouveau foyer de Trypanosomiase humaine au Tchad.** —*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 93–96.

Reference is made to the report of MURAZ on human trypanosomiasis in the Chad district, where it is recorded that the disease does not extend beyond 10° N. [this *Bulletin*, Vol. 19, p. 500]. In December, 1921, Jamot made a rapid examination of the villages on the tributaries of the Logone and Chari in the vicinity of Fort Lamy (12°). The chief focus of the disease appeared to be at Kabé, where canoes are constructed and which is much frequented by fishermen ; 32 infected persons were found among a population of 107 examined (30 per cent.). At Kousseri 13·5 per cent. and at Fort Lamy 2 per cent. of those examined were found to be infected. *Glossina palpalis*

was not found and if it exists must be very scanty; there exists a striking parallelism between the distribution of *G. tachinoides* and that of the disease.

W. Y.

VALCKE (G.). **La maladie du sommeil sur le bief Bukama—Lac Kisale.** —*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 63–72.

The observations recorded in this note are the result of a tour of inspection on the Lualaba between Bukama and Numbi on Lake Kisale.

A general account of the country is given; it was found to be insufficiently cleared of brush and undergrowth. The number of tsetse, *G. palpalis*, vary much according to the season. There appears to be little trypanosomiasis among the people; of 2,473 natives examined, only four were found to be infected. Various recommendations for dealing with the situation are made.

W. Y.

GRIFFIN (R. G.). **Some Observations on the Condition of Lymphatic Glands (with Special Reference to those of the Axillary Groups) noted among Trypanosome-Infected Subjects in the Sleeping Sickness Area of Bukedi, Eastern Province, Uganda.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 55–60.

The following summary is given :—

"(*a*) The axillary glands should be systematically examined in all cases [of suspected human trypanosomiasis], otherwise many infected people will be overlooked.

"(*b*) When bilateral axillary enlargement is found in a known infected area, the case should be regarded as highly suspicious, and in those cases where gland puncture is negative, systematic examination of the blood or animal inoculation should be carried out.

"These notes, of course, do not relate to special hospital or laboratory work, but are brought forward as they may be interesting to those who are working on sleeping sickness investigation; they may also be useful to those who, like myself, are district medical officers, and have to include sleeping sickness control and observation in their administrative and other duties, and who are unable to spare the time necessary for blood examinations, etc. One is often dependent on gland examination and puncture in order to arrive at some idea of the degree and severity of infection in an area.

"The examination of axillary glands in these natives is by no means an agreeable undertaking. However, the work can be made less unpleasant by keeping a couple of 'boys' in advance, one with soap and water and the other with a dry towel to prepare the cases for examination.

"I understand that no depopulation of the Mjanji area was carried out at the time of the epidemic, and thus no break exists in the age-old distribution of human trypanosomiasis around the Kavirondo Gulf. The same state of affairs, I think, exists in the Mpologoma and Kuamu infected areas. There is a considerable amount of communication between these areas, and the inhabitants frequently move their residence from one to the other."

W. Y.

UGANDA PROTECTORATE. **Annual Report on the Bacteriological Department for the Year ended 31st December, 1922.** [DUKE (H. Lyndhurst).]—17 pp. 1923. Entebbe: Govt. Printer.

That portion of the Report dealing with trypanosomiasis is divided into three portions. The first briefly records the fact that transmission experiments have been carried out with laboratory-bred Glossina and two strains of trypanosomes which have been kept up by direct transmission since 1920. These experiments have yielded important results which will be published elsewhere. The next portion summarizes the work done by the author whilst investigating the Mwanza outbreak, which has been recorded in detail elsewhere [this *Bulletin*, Vol. 20, p. 309]. The last portion relates to the reclamation of the shores and islands of Lake Victoria. During the year, territory in the Lake Victoria *palpalis* areas has been reopened to native occupation, about 9,000 natives having returned to the Sese and Buvuma Islands, and landing places have been cleared at intervals along the mainland shore of Buganda Kingdom. It is anticipated that sooner or later cases of sleeping sickness will occur amongst the repatriated population and it is of the utmost importance that such cases be recognized as early as possible in order that the factors governing the reappearance and spread of the trypanosome in man may be studied and controlled. As it is not practicable to examine all repatriates it has been decided to concentrate attention on the fishermen, who will be licensed to fish in the re-opened area. Details of the proposed measures are given. Up to the present, no cases have been reported from the reclaimed areas of the Buganda Kingdom, which include the Sese Islands.

W. Y.

DAVID (J.). **Observation de Trypanose humaine.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1922. Dec. Vol. 2. No. 2–3. pp. 227–230.

An account is given of a case of sleeping sickness (*T. gambiense*) contracted in the Belgian Congo in the Kwango district. The first symptoms were noted in December, 1920, and a diagnosis was made in February, 1921. During the following 12 months the patient was subjected to four courses of treatment consisting of atoxyl, emetic, neosalvarsan and tryparosan. As a result the condition of the patient improved and he increased in weight, but parasites were still present in the blood. He was then sent to Hamburg and given a course of "Bayer 205" consisting of 0·5 gm. on March 30, 1922, 1 gm. on March 31, 1 gm. on April 3, and 1 gm. on April 8. The result is most encouraging; parasites at once disappeared from the blood and had not returned by June 13. A trace of albumen appeared in the urine shortly after the last injection and persisted till May 12. Further details are to be given later.

W. Y.

OUZILLEAU & LEFROU. **Le traitement de la maladie du sommeil par l'atoxyl. Sa réglementation.**—*Ann. Inst. Pasteur.* 1923. Mar. Vol. 37. No. 3. pp. 275–293. [8 refs.]

The authors point out that a definite decision regarding the best means of administering atoxyl in human trypanosomiasis has not yet

been reached, and in the present paper they compare the results obtained at Brazzaville with the various methods commonly adopted. They remark that many of their cases had emetic in addition, but as this was always given in doses of 0·05 to 0·1 gm., according to the weight of the patient, it can be regarded as a constant.

The treatment of patients in the early stage of the disease is considered in the present paper.

A.—*Treatment with small doses of atoxyl.*—These doses are in general less than 0·01 gm. per kilo of body weight, *i.e.*, between 0·3 gm. for a child and 0·5 gm. for an adult. The method adopted at Brazzaville was to inject 0·5 gm. every seven days in the case of natives and every five days in the case of Europeans. Of the 39 cases so treated, all relapsed save one—eight within two months of the cessation of treatment and 30 within a year.

B.—*Treatment with moderate doses of atoxyl.*—These doses are approximately 0·01 gm., or rather more, per kilo of body weight; they vary from 0·5 gm. to 0·75 gm. for an adult. Many patients were treated by this method during 1916–19; the treatment commenced in the first year by a series of weekly doses of atoxyl alternating with emetic; the following and subsequent years the injections were spaced or the dose increased according to the condition of the patient. Treatment was suspended after two or three years when the patient appeared to be maintaining his condition. The duration of the treatment varied considerably; cases could rarely be kept under observation for more than two years, but some (about 5 per cent.) were observed for long periods up to 12 years and others disappeared in the course of treatment. This method gave on the whole poor results.

C.—*Treatment with large doses of atoxyl.*—These varied from 0·015 gm. to 0·02 gm. per kilo, *i.e.*, from 1 gm. to 1·25 gm. for an adult. Since 1920, this method has been carefully tested at Brazzaville. Experience showed that a series of large doses gave the best results. Although, however, it is possible to sterilize definitively some patients by one or two large doses of trypanocidal substances, particularly atoxyl, yet one must not ignore the fact that relapses occur even under these conditions. Should the injections follow one another rapidly? Should the doses be increased or should a prolonged series of injections be given, and, if so, what should be the duration? With reference to such questions as these, it was found that with large doses there should, in order to avoid toxic symptoms, be an interval of 10, or better 14, days between the injections. It was eventually considered best to administer 0·015 gm. per kilo, sometimes rather more, *i.e.*, 0·015 gm. to 0·02 gm., in a series of six injections at intervals of 14 days; sometimes the larger dose of 0·02 gm. per kilo was given for one or two injections only. This treatment has been given to two categories of patients, firstly those treated previously by repeated injections of small or moderate doses of atoxyl and secondly those who had not previously been treated. Of the 102 belonging to the first class 89 have not relapsed after an interval of 14 to 17 months. Of the 84 patients belonging to the second class 21 had been observed for 14–16 months after treatment, 41 for 12–13 months and 22 for 7–12 months. Only 5 have relapsed—3 in the sixth month and 2 in the tenth to twelfth months.

The remainder of the paper is concerned with an enquiry whether the method of administration of a series of large doses of atoxyl is

followed by any deleterious action. In a table it is shown that the treatment does not in early cases of the disease provoke any meningeal reaction. Amaurosis was not observed in early cases of the disease and only very occasionally when the doses were given at too short intervals or were too large. The treatment had no ill-effect on the general health of the patients and they all gained in weight.

W. Y.

LEFROU. **Essais de traitement de la maladie du sommeil à la deuxième période. Les principles directeurs—résultats de leur application.**—*Ann. Inst. Pasteur.* 1923. Mar. Vol. 37. No. 3. pp. 294–321. With 1 text fig. [6 refs.]

In this paper the author enunciates the following principles :—

1. Patients previously untreated and in the second stage of the disease should not be given very large doses of atoxyl, *i.e.*, between 0·0175 gm. and 0·02 gm. per kilo. Some 59 cases in the second stage of the disease showing meningeal reaction were treated by six weekly injections of atoxyl. In 23 of these cases large doses of the drug were given and in 36 doses of moderate size. During an observation period of six months deaths were noted only among the 23 treated by large doses.

2. A series of injections of atoxyl or of neosalvarsan produces as an immediate result a diminution of the lymphocytosis in the cerebrospinal fluid and a slight modification of the quantity of albumen, and these changes generally coincide with clinical amelioration. In a considerable series of cases the condition of the cerebrospinal fluid was noted before treatment and a week after the end of treatment, and also in 26 cases 1½ to 4 months later.

The observations are recorded in two tables, the first dealing with previously untreated and the second with previously treated cases. As a control a further table is given showing the condition of the cerebrospinal fluid at similar intervals in a dozen cases in which treatment was withheld. In still another table the influence on the cerebrospinal fluid of a single injection of atoxyl varying from 0·5 gm. to 1·1 gm. is shown in 10 patients. In 5 of these it was found that a single injection decreased the meningeal reaction, in 2 the condition was unchanged, whilst in 3 it was increased.

3. The amelioration of the meningeal reaction and of the clinical symptoms produced by injections of atoxyl or neosalvarsan is quite temporary ; the lymphocytosis and albumen increase more or less rapidly and the disease runs its course.

In a table observations are summarized on 28 patients who were subjected to a lumbar puncture before treatment and also at a varying time after the last injection, and to these can be added the 26 observations set forth in the previous tables made on patients who submitted to a lumbar puncture, not only before and immediately after treatment, but also some months later.

It appears from this work that the result obtained under the immediate influence of treatment becomes lost as time goes on. Thus, the meningeal reaction which a week after treatment is found to be increased in only 6 per cent. of cases becomes later modified as follows :— In a month and a half to two months later it is found to be increased

in 46·9 per cent. of cases, in three months in 55·5 per cent. of cases, and finally in four to five months in 66·6 per cent. of cases.

4. Injections of emetic do not diminish the meningeal reaction, but on the contrary show a tendency to increase it. Evidence in support of this is shown in a table relating to six patients who received either six injections of emetic or only a single injection.

In view of these principles it appears that the rational therapy of sleeping sickness in the second stage ought to aim at gradually diminishing the meningeal reaction by a series of injections of atoxyl, or of neosalvarsan, given at such intervals that the meningeal reaction never regains its previous intensity. The cases in the second period should be divided into two categories: (*a*) those with trypanosomes in the glands or in the blood, and (*b*) those in which the peripheral circulation is sterile. Class (*a*) should be given a series of injections of atoxyl-emetic, or of atoxyl alone, in order to sterilize the peripheral circulation. Large doses of atoxyl should be avoided and if emetic is used it should be given in the classical doses. A series of injections of atoxyl should be repeated at intervals of two months. Class (*b*) should be treated only by a series of injections of atoxyl at intervals of two months. Fifty-two patients were thus treated, and the results, after an observation period of 9–12 months, are given in a table. Of the 30 new (previously untreated) cases, 24 are living, 4 are dead and 2 are blind. Of the 22 old (previously treated) cases, 16 are alive, 4 are dead and 2 are blind.

The author discusses at some length the cause of blindness and of death in the above cases and also gives information regarding the condition of some of those who are still living.

W. Y.

CHESTERMAN (Clement C.). **Tryparsamide in Sleeping Sickness. A Study of Forty Cases, with Special Reference to the Cerebrospinal Fluid.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. pp. 394–408. [7 refs.]

The observations recorded in this paper were made at Yakusu, near Stanleyville, Belgian Congo. The author received a quantity of tryparsamide from Dr. Louise PEARCE [this *Bulletin*, Vol. 19, p. 136], with the object of testing the results of repeated administration of large doses at weekly intervals by the intravenous route, special attention being given to the cell count of the cerebrospinal fluid in the most advanced cases.

The 40 cases treated were chosen from among the 300 diagnosed during the period, because (1) the source of their infection was known; (2) they showed definite symptoms of nervous involvement and altered cerebrospinal fluid; and (3) they consented to remain in hospital in an area where reinfection could be excluded. A 30 per cent. solution of the drug was made in boiled rainwater; a course of eight weekly injections was regarded as normal, but sometimes this had to be varied because of visual disturbance, when the dose or frequency, or both, had to be changed according to circumstances. The cerebrospinal fluid was observed before treatment and at intervals varying from 1–17 weeks after treatment. The results are summarized in three tables, the first giving the record of 24 cases which had received

no previous treatment ; the second the results obtained in 10 patients who had previously received varying amounts of atoxyl, soamin, tartar emetic, stibenyl, or combinations thereof, without any great or permanent benefit ; and the third a record of six cases first treated by the intrathecal serum method of MARSHALL and VASSALLO [this *Bulletin*, Vol. 18, p. 155 ; Vol. 19, p. 141 ; and Vol. 20, p. 331]. All these serum cases relapsed and the effects of tryparsamide on the four who survived is shown.

The following are the conclusions :—

" These are based on the intravenous administration of tryparsamide, although there is good reason to believe that the intramuscular route is not less efficacious.

" (1) The maximum tolerated dose (which should not exceed 4 grammes per week for the full-sized adult), if given regularly for a period of about eight weeks is capable of completely removing trypanosomes from, and rendering within the normal, the cell content of the cerebrospinal fluid of even the most advanced cases.

" (2) This change in the cerebrospinal fluid is accompanied *pari passu* by a very marked clinical improvement, which has so far been observed to have been fully maintained for periods not exceeding eleven months, the longest time which has elapsed up to date since treatment.

" (3) It is possible to estimate the maximum tolerated weekly dose from a consideration of the clinical condition and cell content of the cerebrospinal fluid of the patient, so that these results can be obtained without danger of producing any appreciable degree of visual disturbance.

" (4) Improvement is hardly less marked in cases which have previously resisted treatment by other arsenical drugs.

" (5) The intravenous method of administration is superior to that of intrathecal serum therapy."

W. Y.

VOEGTLIN (Carl), SMITH (M. I.), DYER (Helen) & THOMPSON (J. W.). **Penetration of Arsenic into the Cerebro-spinal Fluid, with Particular Reference to the Treatment of Protozoal Infections of the Central Nervous System.**—*Public Health Rep.* 1923. May 11. Vol. 38. No. 19. pp. 1003–1021. With 9 charts. [10 refs.]

The experiments described in this paper were conducted with the object of re-investigating the question of the penetration of various forms of arsenic into the cerebrospinal fluid and the central nervous system. The experiments were of two kinds : firstly, chemical, dealing with the study of the rate of disappearance of arsenic from the blood, the arsenic content of the cerebrospinal fluid and the arsenic content of the brain tissue ; and secondly, biological, dealing with the parasiticidal effect obtainable from intravenous injections of various arsenicals on parasites which had been previously injected into the cerebral subarachnoid space. The biological method was elaborated by Smith and Voegtlin in 1921.* It was found that if a heavy suspension of *T. equiperdum* is injected into the cranial subarachnoid space of the rabbit the parasites will survive and be demonstrable in considerable numbers in the cerebrospinal fluid for at least 48–72 hours. The period of sojourn of the majority of trypanosomes in the

* *Jl. Pharmacol. and Experimental Therapy*, xvii, p. 342.

cerebrospinal fluid was deemed sufficiently long to permit a study of the comparative permeability of the meninges for the various arsenicals, as determined by their relative trypanocidal action in the subarachnoid space.

Details are given of the technique adopted.

The drugs first investigated were arsphenamine (alkaline solution) and neoarsphenamine. These two drugs appear to penetrate into the cerebrospinal fluid with considerable difficulty. In a table the trypanocidal effect of intravenous medication on *T. equiperdum* in the cerebrospinal fluid in rabbits is given ; in this table the efficiency of the following drugs is compared :—tryparsamide, sulpharsphenamine, 3-amino-4-oxyphenyl arsonic acid, arsacetin, atoxyl, neoarsphenamine, arsphenamine, silver arsphenamine, " arsenoxide," $CH_3AsO(ONa)_2$.

With reference to the results obtained in the chemical analysis of the cerebrospinal fluid and brain for the presence of arsenic after intravenous treatment of normal rabbits, the data include only findings up to six hours after the time of injection. This period was deemed sufficiently long in view of the fact that about five times the ordinary therapeutic dose was injected and therefore it could reasonably be expected that sufficient arsenic would penetrate into the central nervous system for purposes of establishing the order of magnitude of this penetration. The above mentioned drugs were employed in these experiments and the results set forth in tables and graphs.

The conclusions are as follows :—

" 1. The penetration of arsenic into the cerebrospinal fluid, following the intravenous injection of a variety of arsenicals, has been studied by (*a*) the chemical analysis of the blood, brain, and cerebrospinal fluid for the presence of arsenic, and (*b*) the parasiticidal action obtainable in the cerebrospinal fluid.

" 2. A biological method for the study of the permeability of the meninges for various arsenicals is described.

" 3. From the therapeutic standpoint, the results obtained by means of the biological method possess greater significance than the data secured by chemical analysis, as the former method actually determined the parasiticidal effect of the arsenic which had found its way into the cerebrospinal fluid.

" 4. Arsphenamine, neoarsphenamine, silver arsphenamine, and some other compounds have a relatively low effectiveness, unless very large doses are used.

" 5. Sulpharsphenamine is the most effective arsenobenzene derivative studied, and compares favourably with the highly effective aromatic pentavalent arsenicals, which appear to possess much greater therapeutic power than the well known arsphenamines.

" 6. A greater therapeutic effect can be expected from large single doses, given at longer intervals, than from smaller doses administered more frequently.

" 7. It is pointed out that the failure to obtain a complete sterilization of syphilitic patients in more advanced stages is probably due to the deficient penetrative power of arsphenamine, neoarsphenamine, and silver arsphenamine.

" 8. Sulpharsphenamine, tryparsamid, and 3-amino-4-oxyphenyl arsonic acid are suggested as remedies of superior penetrative power."

W. Y.

Steffan (P.). **Morphologische Untersuchungen ueber die Wirkung verschiedener Heilmittel auf Trypanosomen.** [Morphological Investigation into the Action of Various Drugs on Trypanosomes.]—*Ztschr. f. Hyg. u. Infektionskr.* 1922. Sept. 25. Vol. 96. No. 3. pp. 263–287. With 1 text fig. and 1 plate. [37 refs.]

For the purpose of investigating the morphological change produced in trypanosomes by various drugs, the author used mice at the height of infection with *T. equiperdum*, *T. brucei* or *T. equinum*. The drugs were (*a*) arsenic and antimony preparations (atoxyl, tartar emetic and stibenyl); (*b*) triphenylmethane dyes (parafuchsin and tryparosan); (*c*) acridin dyes (flavicid and trypaflavin); (*d*) safranin dyes (trypasafrol); (*e*) benzidine dyes (trypanrot); (*f*) "Bayer 205"; (*g*) normal human serum.

Most of the drugs examined produced a visible change in the protoplasm of the parasites. Primary protoplasmic damage was produced by atoxyl, tryparosan, flavicid, trypaflavin and trypanrot; but probably trypasafrol, "Bayer 205," and human serum also produced protoplasmic changes. The antimony preparations exhibit a specific affinity for the nucleus as in a less degree do also trypasafrol and trypanrot. Parafuchsin, tryparosan, flavicid and trypaflavin cause the blepharoplast to disappear; information is given regarding the manner in which this takes place. In some cases, especially in those of feebly active drugs, *e.g.*, parafuchsin and trypasafrol, the divisional processes were at first somewhat stimulated; on the contrary a retarding of this process, such as that described by Mayer and Zeiss, occurs after high doses of "Bayer 205" [this *Bulletin*, Vol. 17, p. 334]. In addition such changes were observed as vacuolation of the blepharoplast, inflation of the posterior end and so forth. Of the three parasites investigated *T. brucei* reacted most quickly and intensely and *T. equiperdum* most slowly.

W. Y.

Zironi (Amilcare). **Sulla attività dei vari arsenobenzoli nella cura della tripanosomiasi.** [The Activity of the Various Arsenobenzols in the Treatment of Trypanosomiasis.]—*Terapia.* Milan. 1923. Mar. 1. Vol. 13. No. 48. pp. 14–26.

In these experiments mice, rats, rabbits, dogs and guinea-pigs infected with *T. brucei* were used. It was found that novarsenobillon and sulfarsenol exerted only slight trypanocidal activity and did not cause the disappearance of parasites from the circulation. "Sanar" and "914" exhibited considerable activity, but the best results were obtained with Neoiacol, a new Italian preparation. Subcutaneous injections proved to be more efficacious than intravenous. Details of the various experiments performed are given in a series of tables.

W. Y.

Sei (Shigemoto). **Ueber den Einfluss von "Bayer 205" auf das Blut.** [The Influence of "Bayer 205" on the Blood.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 4. pp. 130–142. [7 refs.]

The following summary is given :—

The investigations which were conducted on healthy rabbits showed that administration of "Bayer 205" resulted in :—

1. A decrease in the number of red corpuscles, which was most marked some days after treatment.

2. A decrease in the haemoglobin content, which was likewise most marked some days after treatment.
3. The appearance of numerous nucleated red cells.
4. No appreciable influence on the number of leucocytes.
5. In one animal, 2–4 days after treatment, there was a slight polynuclear increase and a corresponding decrease of lymphocytes; this was followed on the sixth day by a slight fall in the polynuclears and increase in the lymphocytes. Morphologically there was evidence of considerable damage to the polynuclear leucocytes.
6. The rate of sedimentation of the erythrocytes (as tested by Linzemeier's method) was greatly accelerated.
7. The complement content of guinea-pigs' blood was not reduced by treatment with "Bayer 205."

W. Y.

Luengo (E.) & de Buen (S.). **Poder tripanolitico del suero de un enfermo tratado por el "Bayer 205."** [The Trypanolytic Property of the Serum of a Patient after Treatment with "Bayer 205."]—Reprinted from *Bol. Soc. Española de Biol.* 1922. Vol. 10. No. 1. 5 pp.

Four series of experiments were carried out with the serum of a patient who had received in all 8 gm. of "Bayer 205." In the first, 0·2 cc. of the serum with 0·05 cc. of the blood of a guinea-pig heavily infected with trypanosomes from the same patient was inoculated into the peritoneal cavity of a white rat. In 15 minutes marked trypanolysis took place. In a second series, to test the minimum trypanolytic dose, the effect was found to be very definite with 0·05 cc., very slight with 0·025 cc., though the "incubation" was prolonged. A third series was devised to test whether the effect was due to the serum itself or to the presence of the drug in the serum. The serum of a treated patient showed marked trypanolysis, whereas normal serum *plus* "Bayer 205" in proportion of 0·005 gm. per cc. showed none. Lastly, such serum was found to possess an agglutinative power on the trypanosomes and the trypanolytic action was seen to be largely specific; on other strains the effects were but slight.

H. Harold Scott.

van den Branden (F.) & van Hoof (L.). **La méthode de "Marshall" dans le traitement de la trypanosomiase humaine.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 25–35. [7 refs.]

Referring to Marshall's intrathecal method of treatment in sleeping sickness [this *Bulletin*, Vol. 19, p. 141, and Vol. 20, p. 331], the authors state that it appears to them that Marshall and Vassallo would have obtained equally good results if they had refrained from giving the intrathecal injection and had administered only the intravenous injection of salvarsan. Details are given of two cases observed by the authors; the first was given a single dose of 0·20 gm. of cupric salvarsan on July 22, 1913, and was still well and apparently free from parasites in December, 1921; the second was given a single injection of 0·75 gm. of neosalvarsan on January 9, 1914, and was still well five years later.

A series of 14 cases in various stages of the disease were treated by MARSHALL's method ; details of each case are given. Of the 12 cases injected intraspinally with salvarsanized serum 10 relapsed with parasites in their blood in from 3–4 weeks ; in the other two, parasites have not reappeared in the blood, but the general condition has deteriorated. In two patients treated by intraspinal injection of their own serum only trypanosomes did not disappear from their blood.

The conclusions are :—

1. Marshall's method is not even original ; long ago it was abandoned in the treatment of human trypanosomiasis.
2. Salvarsanized serum is not an irritant for the spinal canal.
3. Intrathecal injection of salvarsanized serum has no trypanolytic action. The peripheral sterilization obtained by the method must be attributed to the previous injection of salvarsan.
4. Intrathecal injection of blood serum has no curative action ; it does not even produce a temporary peripheral sterilization.
5. Intrathecal injection of the serum of a chronic case, which has been treated successfully, has no curative action on another case ; it does not even produce temporary sterilization.
6. Intrathecal injection of serum removed after previous injection of atoxyl, soamin, silver-salvarsan, galyl and tryparsamide likewise has no curative effect and is followed by only a temporary sterilization, which is due to the initial injection of the drug.

W. Y.

CROWELL (Bowman Corning). *Trypanosoma cruzi* **in the Tissues of the Armadillo.**—*Jl. Amer. Med. Assoc.* 1923. Mar. 31. Vol. 80. No. 13. pp. 910–912. With 3 text figs.

A microscopic examination was made of the tissues of an armadillo, naturally infected with *T. cruzi*, captured at Lassance, the centre of the endemic zone of Chagas' disease. Examination of the heart showed lesions of the myocardium and parasitization of the cardiac muscle fibres. An interesting finding was the presence of a parasitic thrombus in a small artery in the myocardium, the thrombus being literally filled with *T. cruzi*. The apex of the heart was free from lesions and parasites, but sections from the region of the auriculo-ventricular sulcus showed a marked infiltration of mononuclear cells and parasitized muscle fibres.

W. Y.

PINTO (Cesar). **O** *Triatoma brasiliensis* **Neiva transmitte o** *Trypanosoma cruzi* **Chagas.**—*Brazil-Medico.* 1923. Feb. 10. Year 37. Vol. I. No. 6. p. 73.

At the end of 1922, examples of *Triatoma brasiliensis* were received at the Institute of Oswaldo Cruz from Quixada (State of Ceará) ; these bugs, which were found to be infected with *T. cruzi*, have been recorded from the States of Rio Grande do Norte, Ceará, Piauhy, Bahia and Minas Geraes.

W. Y.

BATTAGLIA (Mario). **Encephalitis bei experimenteller Trypanosomiasis.** —*Cent. f. Bakt.* I. Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. pp. 94–96.

This work is a continuation of that already recorded [this *Bulletin*, Vol. 19, p. 147].

In sections of brain of animals which had died of various trypanosome infections (*T. battaglia, T. lewisi, T. brucei, T. dromedarii* and *T. gambiense*) rounded bodies were found either within or around the nerve cells. These bodies, which were arranged like diplococci, or cross-wise, or in groups, were biscuit-shaped, club-shaped, or rod-shaped, and reminded one of the Negri bodies seen in rabies and distemper. They have sharp round contours and were found scattered through the entire central nervous system. The author considers that this finding is constant in all infections of the central nervous system characterized by hyperaemia and lymphoid infiltrations and by definite lesions of the nervous tissue.

Clinically, animals suffering from trypanosomiasis, distemper or rabies, and man with sleeping sickness, cerebral syphilis and encephalitis lethargica, exhibit analogous symptoms due to alterations in the central nervous system. The pathological lesions in these infections are more or less similar and show a severe damage not only of the vessels and connective tissue, but also of the cytoplasm and nuclei of the nerve cells. The cell body exhibits various changes in form and reaction to dyes reminding one of well-known micro-organisms. These appearances, although sometimes of diagnostic value as in rabies, have nothing to do with the evolution or involution phases of the parasites causing the disease.

W. Y.

Rosenthal (F.) & Freund (R.). **Weitere Untersuchungen ueber die trypanoziden Substanzen des menschlichen Serums.** [Further Investigations on the Trypanocidal Substances in Human Serum.] —*Klin. Woch.* 1923. Apr. 30. Vol. 2. No. 18. p. 836, and *Ztschr. f. Immunitätsf. u. Experim. Therap.* I. Teil. Orig. 1923. June 22. Vol. 37. No. 1/2. pp. 48–76. [17 refs.]

These two papers deal with the same matter, the former being a brief summary of the work recorded in detail in the latter paper. They form a continuation of the work already recorded on this subject [this *Bulletin*, Vol. 19, pp. 154 and 520, and Vol. 20, p. 337].

The conclusions are as follows :—

1. The liver is to be regarded as the chief seat of formation of the trypanocidal substances (or their precursors) in human serum.

2. These substances are to be found in the euglobulin—and pseudoglobulin—fraction and have nothing to do with the fibrinoglobulin and albumen fractions.

3. Immunization with active trypanocidal human serum does not result in the production in rabbits and mice of specific antibodies against the trypanocidal substance. The trypanocidal substance in human serum has then no antigen property. Neither specific precipitation nor contact with foreign serum suffices to produce any perceptible decrease in the trypanocidal property.

4. The repeated injection of large quantities of active human serum inhibits the protective action of a dose administered after an interval. This phenomenon of inhibition of trypanocidal serum has a specific character.

5. The phenomenon of inhibition of serum trypanocidal action in previously treated animals is not the result of the formation of antitrypanocidal bodies. It is not a true immunity process, but represents

on the contrary an exhausting phenomenon of the treated animal whereby the production ceases of a body which has the power of forming trypanocidal substances out of the injected human serum.

6. Human serum does not contain trypanocidal substances but only trypanocidogenous bodies, which are at first inactive. On the introduction of the human serum into the animal organism a substance (ferment) is called into action which changes the trypanocidogenous bodies into trypanocidal bodies.

7. It appears from this still doubtful whether the trypanocidal property of human serum plays any important part in the natural immunity of man to the trypanosomes of animals.

W. Y.

Savini (Emile). **Infection trypano-spirochétique.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 956–958.

On four occasions out of 62 passages of *T. brucei* through mice, spirochaetes turned up spontaneously in the mouse's blood. On the seventh and eighth days the trypanosomes and spirochaetes were almost as numerous as the red cells and the animals died on the tenth and eleventh days. Spirochaetes were found not only in the blood, but in all the organs and in the intestine; they were 10–20μ long, with 5–12 spirals; the extremities were effilate. The author believes that nagana sensitizes the organism for the reception of the second infection. The spirochaetes are non-pathogenic; all attempts to culture them were in vain, as likewise were attempts to carry on the strain by inoculation and cause the spirochaetes to invade the blood from the intestine. In this connection the author refers to the spirochaetes found by Blieck (1913) shortly before death in the blood of a calf inoculated with piroplasma and to the various spirochaetes found in the blood and organs of man in various diseases, *e.g.*, blackwater fever.

W. Y.

i. Slavoaca (Titus). **Contribution á l'étude du mécanisme de l'action de l'atoxyl dans la trypanosomiase des souris.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 927–929.

ii. ——. **Relation entre la dose thérapeutique du salvarsan et le degré de l'infection dans la trypanosomiase des souris.**—*Ibidem.* pp. 939–941. [2 refs.]

i. As the result of experiments on mice infected with nagana, the author concludes that the action of atoxyl is direct and the intervention of the organism of the mouse is not necessary for the production of the active substance; apparently the parasites are able to reduce the drug in their own bodies and to transform it in active substances.

ii. In these experiments the author used mice infected with a strain of *T. brucei*, which killed them in three days. He made three series of observations, each consisting of five mice. Four of the animals in each series received respectively 0·02 mgm., 0·04 mgm., 0·06 mgm., and 0·08 mgm. of salvarsan, the fifth animal being in each case used as a control. The animals of the first series were treated one hour after infection, those in the second series on the following day, and those in the third series on the third day. The results showed that the further the infection is advanced the less the quantity of drug required to give rise to a cure.

W. Y.

i. MAYER (Martin). **Bemerkung zu der Arbeit von Karl** [*sic*] **Hesselbach: Die trypanozide Wirkung von "Bayer 205" auf** *Trypanosoma equiperdum.* **Bd. 89. H. 4/5. S. 48 dieser Zeitschrift.** [Remarks on the Work of K. Hesselbach: the Trypanocidal Action of "Bayer 205" on *T. equiperdum.*]—*Cent. f. Bakt.* I. Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. p. 96.

HESSELBACH (Kurt). **Entgegnung auf die Bemerkung von Prof. Martin Mayer zu der Arbeit von Kurt Hesselbach: Die trypanozide Wirkung von "Bayer 205" auf** *Trypanosoma equiperdum.* **Bd. 89. H. 4/5. S. 48 dieser Zeitschrift.**—*Ibid.* May 4. No. 4. p. 271.

ii. LOW (George C.) & MANSON-BAHR (Philip), with others. **The Treatment of Human Trypanosomiasis by "Bayer 205."**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Jan. 18. Vol. 16. No. 7. pp. 339–393. With 1 plate. [57 refs.]

iii. CHEINISSE (L.). **Deux nouveaux agents trypanocides.**—*Presse Méd.* 1923. Jan. 27. Vol. 31. No. 8. pp. 81–83. [14 refs.].

iv. VAN DEN BRANDEN (F.) & VAN HOOF (L.). **Trypanoléine van Saceghem dans la trypanosomiase humaine.**—*C.R. Soc. Biol.* 1923. Mar. 10. Vol. 88. No. 9. pp. 627–629. [2 refs.]

i. Mayer complains that HESSELBACH [this *Bulletin*, Vol. 20, p. 325] does not refer adequately to the previous work of MAYER & ZEISS or to that of HAENDEL and JOETTEN [this *Bulletin*, Vol. 17, pp. 333 & 334].

Hesselbach replies.

ii. This paper deals with the same observations as those recorded in a previous article [this *Bulletin*, Vol. 20, p. 323].

iii. A general account of some therapeutic observations made on tryparsamide and "Bayer 205." Nothing new.

iv. The diagnostic value of the trypanoléine test of VAN SACEGHEM [*Trop. Vet. Bulletin*, Vol. 11, p. 44] was examined in six cases of human trypanosomiasis, the conclusion reached being that the test was of no practical value.

W. Y.

Erratum.

Bulletin, 1923, No. 4, p. 317. Commenting on a paper by MACKENZIE, who recorded an acute case of Rhodesian sleeping sickness in which the patient developed interstitial keratitis, the reviewer remarked that this symptom had not been observed before in human trypanosomiasis. This is incorrect. Interstitial keratitis appears to be not rare in Nyasaland [HEARSEY; SHIRCORE, this *Bulletin*, Vol. 1, pp. 279 & 656], and has been observed in Senegal by THIROUX and D'ANFREVILLE [*loc. cit.*, p. 279, footnote] in a case in which the trypanosome was believed to be *gambiense.*

W. Y.

PEARCE (Louise). **Intrathecal Injections of Tryparsamide.** [Correspondence.]—*Brit. Med. Jl.* 1923. May 19. p. 883.

SHARP (N. A. Dyce). **The Dose of Bayer "205."** [Correspondence.]—*Lancet.* 1923. May 19. p. 1026.

AMOEBIASIS AND DYSENTERY.

Amoebiasis.

Hage. **Nachuntersuchungen bei Amöbenruhr.** [Further Investigations in Amoebic Dysentery.]—*Arch. f. Schiffs- u. Trop.-Hyg.* 1923. Apr. Vol. 27. No. 3. pp. 93–109. [26 refs.]

These investigations were made upon the personnel of the much-reduced German navy and classified under three headings :—

1. Those who had undoubtedly suffered from amoebic dysentery.
2. Those who had suffered from " clinical dysentery " in countries where amoebiasis is known to occur.
3. Those who, while suffering from dysentery, cause unknown, had been in contact with true sufferers from amoebic dysentery.
4. Those who had resided in countries where amoebic dysentery is common, but had not suffered from " dysentery."

In all 96 were examined, the faeces being examined fresh and stained, with a few exceptions, on five or six days, possibly spread over several weeks. Of 23 of the first group, 19 were found to be passing either the active forms or cysts of *E. histolytica*. The number of parasites varied enormously from day to day. Two cases suffered from hepatic abscess to which they eventually succumbed. One man, a prisoner of war in Russia, appeared to have contracted his infection from drinking water on the Amur, near Lake Baikal. Energetic treatment with emetine during the acute stage appeared in no way to minimize the liability of the patient to become a cyst carrier.

In the second group, out of 23 examined, 7 were found to be cyst passers, and all had suffered from severe clinical dysentery.

In the third group are included three cases who contracted amoebic dysentery while serving in France and Belgium.

The fourth group contained 47 cases of which 8 (17 per cent.) were found to be carriers of *E. histolytica* cysts.

P. H. Manson-Bahr.

Gaehlinger. **Épreuve biliare par la cure de Chatelguyon pour le diagnostic et le traitement de la dysenterie amibienne.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 100–103.

The microscopic diagnosis of amoebic dysentery is often difficult, or even impossible, on account of the scarcity of the parasites. The administration of biliary extracts to the patient provokes a benign attack and renders the detection of the parasites more easy. Chatelguyon water by stimulating the secretory apparatus has the same effect.

Four observations to this effect were made on as many resistant cases of amoebic dysentery. Cysts and entamoebae soon appeared in the faeces and all were subsequently cured with emetine or novarsenobenzol.

The author concludes that this water, which contains chloride of magnesia, has an effect not only in provoking a mild exacerbation of the disease, but also in assisting in the cure. The cicatrization of the bowel is aided by injection of the water, drop by drop, into the rectum.

P. H. M-B.

FIDAO (G.). **Forme fruste d'amibiase hépatique primitive.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 241–243. [1 ref.]

Obscure primary cases of hepatitis have occurred in the author's practice. The patients have a pallid look, are emaciated, weak, and extremely easily fatigued, liable to dyspnoea and to sudden profuse sweats and broken sleep. Malaria was naturally suspected, but in seven no parasites were found and the condition of the others was not alleviated by quinine. The intestinal functions were normal ; no diarrhoea or dysentery. Two had been in Belgian Congo only six or seven months. One had an acute attack of hepatitis terminating in amoebic liver abscess. On a course of emetine injections, each consisting of 0·12 gm. of emetine hydrochloride, given twice daily, they all made a remarkable recovery. The author therefore considers these obscure cases of hepatitis to have been amoebic in origin.

P. H. M-B.

HEYMANN. **De l'exploration radiologique du foie après insufflation d'air dans le péritoine. Diagnostic d'abcès du foie par Pneumo-péritoine. (Annex au Rapport du Dr. Le Roy des Barres.)**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 86–89. With 3 plates. [10 refs.]

A successful radioscopic diagnosis of liver abscess depends upon the assemblage of a number of signs—most of which are remote signs due to the swelling of the liver itself ; seldom can a shadow of the abscess be obtained. A large number of cases cannot be diagnosed by the X-rays.

The difficulties in radioscopy of the liver are due to anatomical peculiarities. The lower border and the left lobe, in spite of artificial aids (gaseous dilatation of the stomach and rectal injections), are very difficult to define. The shadow of the diaphragmatic muscle is apt to be confused with the outline of the liver itself. A normal liver will give a dense shadow about the centre for certain physical reasons.

After insufflation of the peritoneal cavity with air the liver becomes remarkably apparent and its borders well-defined.

Insufflation is extremely simple ; the apparatus consists of a lumbar puncture needle mounted on an india-rubber tube. The intestine should be emptied and an injection of morphia is a necessary preliminary. Usually, the gas is completely absorbed within 24 hours.

A case is cited in which an opacity in the liver in a radiograph obtained by the pneumo-peritoneal method indicated a small abscess in the lower portion of the right lobe and this was proved at operation to be correct.

The author is of the opinion that this is the only radiographic method with which the diagnosis of liver abscess can be made with certainty. Ten references are appended.

P. H. M-B.

MORIN (Jean). **Contribution à l'étude de l'hépatite amibienne.**—*Rev. Méd. de la Suisse Romande.* 1922. Apr. Vol. 42. pp. 235–242. With 1 chart.

Amoebic dysentery, with its associated hepatic and pulmonary complications, is of sufficient rarity in Switzerland to be worthy of

notice when it occurs. The observations here recorded were made on interned prisoners of war.

The protocols of one case are given at great length and demonstrate amply the difficulty of making a diagnosis, especially in countries where amoebiasis is a rarity. Here, for instance, provisional diagnoses of tuberculosis, malaria and pyelitis were made.

No assistance was derived from an X-ray examination, there was no dysenteric history, the stools did not contain entamoebae or cysts. The negative results of special hepatic efficiency tests (" haemoclasic crisis " of WIDAL) did not at first lead the various consultants to suspect the liver to be the seat of suppuration. The marvellous therapeutic action of emetine given on purely empirical grounds clinched the diagnosis.

P. H. M-B.

ESCOMEL (Edmundo). **Veinticinco casos de hepatitis supurada, curados sin operación, por las inyecciones de emetina.** [Twenty-five Cases of Suppurative Hepatitis cured by Injections of Emetine.]—*Cronica Méd.* 1923. Mar. Vol. 40. No. 717. pp. 85–94.

Only a small portion of this paper deals directly with the subject of liver abscess. In none of the 25 cases was puncture or incision employed. The author injects 2 cgm. of emetine with an equal quantity of sparteine (to counteract any cardiac depressant effect of the emetine) in 2 cc. of distilled water daily. The number of injections varied between 10 and 20. For hepatitis following rapidly on dysentery 12 are needed ; for a small abscess 20 ; for a large abscess 30. The emetine acts, in dysentery, partly by its toxic action on the entamoeba and partly by its haemostatic action depriving the parasite of its chief nutriment, blood. According to the author, it is not the cysts that are infective, but the entamoeba which encysts on coming in contact with the gastric juice, passes on to the large intestine, is there transformed into the free amoeba again, sets up dysentery and passes by the haemorrhoidal veins to the liver.

H. Harold Scott.

MANSON-BAHR (Philip), LOW (George C.), PRATT (J. J.) & GREGG (A. L.). **The Treatment of Liver Abscess by Aspiration, with an Account of Fifteen Cases.**—*Lancet.* 1923. May 12. pp. 941–945. [26 refs.]

Operations performed for the relief of amoebic abscess of the liver have hitherto been regarded as in every case serious enough to warrant a guarded and even a grave prognosis. The open operation of former days resulted in a mortality varying from 30 to 50 per cent. Treatment by aspiration was suggested nearly a century ago, and in 1884 the mortality recorded by TOMES was more than double that following the open method.

During the last twenty years there has been an ever-increasing number of advocates for aspiration combined with medicinal treatment. The pioneer was Sir Leonard ROGERS, who in 1902 suggested injection of quinine into the evacuated abscess cavity ; later, emetine hydrochloride was employed in place of quinine.

The present paper records the excellent results of aspiration combined with a course of emetine subcutaneously, and emetine bismuth

iodide by the mouth with a view to removing the source of infection in the bowel. Fifteen consecutive cases are recorded in detail without a single death. Eleven of them were treated by the method specified ; and in three cases emetine, and in one case eusol, was injected into the abscess cavity, although among their conclusions the authors state that " injection of emetine into the abscess cavity is by no means essential, nor, in our opinion, advisable."

There are three great advantages to be inferred from the paper under review :—(1) that aspiration is quite a simple matter, and can be undertaken with every probability of success where a patient is obviously too ill to admit of a major (open) operation ; (2) the patient is not necessarily subjected to the ordeal and dread of a general anaesthetic ; (3) the stay in hospital is much shorter than with previous methods ; the average of this series of fifteen was less than a month, in one case eleven days only.

[The authors are to be congratulated upon their paper and the successes described. Reports of further cases will be awaited with interest in order that fuller comparisons with other records may be made, for TALBOT, in 1919, performed " successful aspiration in eleven cases, with no deaths, in Mesopotamia," presumably without medicinal treatment.]

H. Harold Scott.

LUDLOW (A. I.). **Liver Abscess. Report of One Hundred Operations.** —*Surgery, Gynecology & Obstetrics.* 1923. Mar. Vol. 36. No. 3. pp. 336–343. With 4 figs. [10 refs.]

This ranges over the same gound as the paper reviewed in this *Bulletin*, Vol. 17, p. 8.

All the patients were Koreans ; none were Europeans or Americans, although amoebic dysentery is of common occurrence amongst them ; their freedom is attributed to early and energetic treatment with emetine.

In the series the age ranged from 7 to 50 years ; there were two boys of 7 and 10 and only eight females, the highest percentage yet recorded. Apparently the great majority of the males were addicted to alcohol. Amoebic dysentery is frequent in the locality and *E. histolytica* was found " in 10 per cent. of the 50 cases in which faecal examination was made."

All the abscesses in individual lobes were single or easily converted into single abscesses ; they varied from 4 cm. in diameter to that of nearly the entire lobe. Those which had ruptured contained 3 litres of dark red pus, at times foul in odour. In 93 cases the abscess was situated in the right lobe only, in 2 in the left and in 5 in both.

In the sputum of 7 ova of *Paragonimus westermanii* were found, and in 2 tubercle bacilli. Rupture into the pleural cavity occurred in 9 cases, through the chest wall once ; necrosis of the ribs 5 times, 2 pre- and 3 post-operative. Rupture into the abdominal cavity was noted 5 times. Albumin in the urine was found in 6 cases and ascites in 6. Many cases had no fever on admission to hospital.

Uncomplicated cases had a fairly normal blood count ; very few presented a high leucocytosis, 27,400 being the highest reported.

The symptoms presented are variable. Almost every patient gave a history of diarrhoea, chills, or sweats, at some time during the period

of illness. In eight cases distinct swelling was observed in the epigastric region and in five in the right side of the abdomen. Enlargement of the liver below the costal margin could, as a rule, be detected by palpation. Deep fluctuation was obtained in ten cases. Attention is directed to one sign which is invariably present—deep-seated pain elicited by a sudden thrust with the end of the finger, usually at the ninth interspace, about 2 in. from the right costal border.

Most frequently the liver dullness is enlarged upwards, often reaching the fifth rib in the mid-axillary line and the angle of the scapula posteriorly.

The pulse, temperature and respiration may all be misleading.

Treatment by aspiration, together with the use of emetine, is now being tried. The procedure generally adopted by the author is as follows :—A preliminary treatment by subcutaneous injections of 0·06 gm. is given daily for 2–4 days, during which any intestinal parasites which are present are expelled. The aspirator is employed for diagnosis only and used in the operating theatre as a prelude to operation. The trocar is inserted under local anaesthesia, and should the patient's condition be serious it is wise to perform the operation under the same method. Incision is made parallel to the ninth rib, beginning 2 in. from the right costal margin. A portion of rib 2–3 in. in length is resected, the diaphragm incised and liver exposed. A small incision is made in its capsule and the wound enlarged by opening the scissors and drawing them out. After most of the pus has been evacuated the cavity is packed with gauze and left undisturbed for two days. The abscess is subsequently drained with rubber tube and gauze. The emetine injections are continued for four days after operation or longer if symptoms persist. The mortality in this series was 10 per cent.

P. H. M-B.

Combier (V.) & Murard (J.). **A propos des grands abcès du foie ; la forme aigue de ces abcès : quelques remarques au sujet de leur traitement.**—*Presse Méd.* 1923. Apr. 28. Vol. 31. No. 34. pp. 386–388. [4 refs.]

A very acute type of liver abscess exists which the authors consider has not been sufficiently recognized, in which the process is so rapid that a seropurulent fluid forms in place of the more familiar liver abscess pus. A case is cited in which the onset was acute with very considerable hepatic and epigastric pain and the clinical picture resembled that of some acute intra-abdominal condition. The urine contained a quantity of albumin. At operation, and afterwards at the autopsy, a small gangrenous area was found on the anterior surface of the right lobe.

A second case is recorded in which under local anaesthesia the abscess cavity was opened and evacuated and the wound closed by suture. This seemed to answer admirably, for healing was firm and by first intention. Unfortunately the patient died one month afterwards, and the state of the liver was verified at autopsy.

Liver puncture should be performed more often since it is a simple operation, free from danger. Indeed, they cite cases in which 25 punctures have been made at one operation without any harmful results.

P. H. M-B.

Ramond (Louis), Denoyelle & Lautman. **Un cas d'amibiase pulmonaire pure sans abcès du foie guéri par l'émétine.**—*Bull. et Mém. Soc. Méd. Hôpit. de Paris.* 1923. May 10. 3rd Ser. Year 39. No. 15. pp. 655–662. With 2 figs. in text.

The case was one in which pulmonary complications were readily cured by injection of emetine, but there was no ascertainable involvement of the liver. Pulmonary amoebiasis has not been generally recognized ; it is probably rarer than hepatic abscess. The patient, an aviator who had been flying in Morocco, was troubled with constant cough, often accompanied by blood-stained expectoration. Radioscopic examination showed a definite opacity at the base of the right lung, where the percussion rate was impaired and bronchopneumonic signs were present. The sputum contained no tubercle bacilli, but abundant cellular elements, such as leucocytes and altered red cells.

The tentative diagnosis of amoebic pulmonary abscess was arrived at by consideration of the previous history of the patient, who had suffered in 1919 from an attack of amoebic dysentery followed by distinct relapses.

The pyrexia, which reached 103° F., immediately resolved after the exhibition of emetine, as is effectively illustrated by the chart. In the absence of any direct proof, *i.e.*, the presence of the *E. histolytica* in the sputum or in the faeces, the diagnosis must rest upon probability and the remarkable response to the therapeutic test. One symptom that is of value is the character of the sputum—purulent and haemorrhagic, composed of viscid mucus, and sometimes chocolate coloured, and liable to be mistaken for that of pulmonary tuberculosis.

The operative treatment of this condition is not likely to succeed ; in fact, the cases in which operation has been attempted have been generally fatal, in strong contrast to the almost miraculous action of emetine.

P. H. M-B.

Willmore (J. Graham). **The Treatment of Refractory Cases of Amoebic Dysentery.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 13–26. (Discussion, pp. 33–45.)

Experiences of the last two years in the Ministry of Pensions' Hospital are here set forth. All the cases were diagnosed by the discovery of *E. histolytica* in the faeces. The author's practice has been to give 10 gr. of emetine and 60 gr. of emetine-bismuth-iodide concurrently in 20 days, with the following results :—

1. Of 358 cases treated by emetine and emetine-bismuth-iodide :—
   - 99 were presumably cured after the first course .. 28 per cent
   - 259 relapsed .. .. 72 ,,
2. Of these 259 cases, 183 received a second course :—
   - 36 were presumably cured .. .. 20 ,,
   - 147 relapsed .. .. 80 ,,
3. Of these 147 cases, 59 received a third course :—
   - 3 were presumably cured .. .. 5 ,,
   - 56 relapsed .. .. 95 ,,
4. Of these 56 cases, 26 received a fourth course.
5. Of the 26 cases, 8 received a fifth.
6. Of the 8 cases, 7 received a sixth.

The incidence of relapses in categories 4, 5 and 6 was 100 per cent.

7. Of 54 cases treated by emetol and paremetol :—

48 [? 28] were presumably cured	52	per cent.
26 relapsed	48	,,

8. Of 91 cases treated by emetine periodide (*inter alia*) :—

43 were presumably cured after the first course ..	47	,,
48 relapsed	53	,,

Of these 48 cases, 37 received a second course :—

14 were presumably cured	38	,,
23 relapsed	62	,,

Of these 23 cases, 7 received a third course :—

2 were presumably cured	29	,,
5 relapsed	71	,,

From these figures Willmore argues that neither emetine nor emetine-bismuth-iodide are specific cures for amoebiasis. Both are valuable drugs, but they do not always eradicate the infection or prevent relapses. For the incurable residue, other methods have had to be devised.

In considering the effect of various drugs on the entamoeba it is pointed out that encystment never occurs in the liver, nor can the organism exist in the vegetative state in the small intestine. Possibly encystment is due to the presence of anti-enzyme, and this substance is not elaborated in the liver. The worst cases to cure in Willmore's experience are those which pass from one acute relapse into another and are completely refractory to emetine in any form and in which encystment of *E. histolytica* does not appear to take place. In these cases, too, the disease does not affect the general health as much as one would expect; they do not develop liver abscess nor become fulminant.

The difficulty of treating the colon by medication *per os* is due to the drug having to travel 25 ft. through the digestive and absorptive tract before it can exercise its effect, which it has to do over any or every point in a section six or more feet in length; consequently it has seemed desirable, especially if the treatment is controlled by sigmoidoscopy, to supplement medication *per os* by medication *per rectum*.

To a solution of emetine base, 1 gr. in 2 drachms of olive oil, are added 4–6 drachms of ether and another 8 oz. of olive oil, and the whole, after a preliminary washout, is injected slowly into the bowel, the patient being retained, by the aid of bed-blocks and pillows, in as "inverted" a position as possible. These injections are usually given every other day, 6–12 completing a course, the good effects of which, in the areas which the enema can reach, are confirmed by sigmoidoscopy. A larger enema is not well tolerated.

Ipecacuanha—in bolus or cachets, in membroids, or in intensive doses of 30–45 gr. daily, or in smaller doses for months—and alcresta have proved to be less effective than emetine or emetine-bismuth-iodide. Ravaut's paste is undoubtedly a useful adjunct in most cases, but has no real curative value. The same may be said of simaruba and pomegranate. Decoction of Kûrchi bark is now being tried. It does not eradicate the infection, but seems to keep the entamoebae under control. A solution of emetine oleate in liquid paraffin, 1 gr. to 2 drachms, termed paremetol had to be discontinued on account of its nauseating qualities.

Emetine periodide prepared by MARTINDALE has received an exhaustive trial. It is a dark purple, crystalline powder insoluble in physiological acids, but split up with liberation of emetine by a 2 per cent. sodium carbonate solution. It is possible that the bulk of contained emetine (38·7 per cent.) is liberated by the action of the bile and other alkaline secretions.

The present practice consists in giving :—Emetine hydrochloride 1 gr. intramuscularly, and 1 gr. of emetine base in ether-olive oil *per rectum* ; each for six days on alternate days. Concurrently, 2 gr. of emetine periodide are given *per os* three times daily for 15 days with 5 gr. of *fel bovinum* t.d.s. in separate capsules.

So far, emetine periodide appears to be by far the most effective, and the least toxic, of all the emetine preparations tried. It will probably supersede emetine-bismuth-iodide just as ether-emetol may supplement intramuscular emetine, except for amoebic hepatitis, when the latter method is effective. E.P.I. (emetine periodide) may be given as an intensive course of 90 gr. in a short period of 15 days, and this may be repeated after 10 days interval. From the patient's point of view there are many advantages—the absence of nausea, vomiting, depression and weakness, which attended the use of E.B.I. No cardiac dilatation, no emetine rash, desquamation or neuritis has followed the administration of 120 gr. in 20 days. It seems to be as effective as emetine-bismuth-iodide, though, as it has been tested for less than one year, it is premature to offer any opinion as to the permanency of the cure. The cases so far treated successfully had proved refractory to all the known standard methods of anti-amoebic treatment.

The diagnosis, treatment and prognosis of all cases of *E. histolytica* infection should be controlled by clinical and sigmoidoscopic examinations ; scrapings should be taken from the yellow submucous points and examined fresh under the microscope. The examination should be performed without an anaesthetic and the instrument be guided by eye. It is encouraging to watch the healing of amoebic ulcers, but dangerous to rely entirely on these findings in making a prognosis. If the caecum be left infected, the infection appears to trickle down the bowel.

If any benefit is to accrue from treatment, it will be quickly apparent. Emetine in any form is a poisonous drug and care is always necessary in its administration.

P. H. M-B.

MARTINDALE (W. H.). **A Note on Emetine Preparations for Rectal and Oral Use.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Mar. 15 & May 17. Vol. 17. Nos. 1 & 2. pp. 27–32. (Discussion, pp. 33–45.)

WILLMORE suggested to Martindale to combine the alkaloidal base —emetine—with one of the fatty acids, such as the oleate, for administration as enema, with the proviso that the solution must be permanent for storage prior to use. Hence the enema, the composition of which is given above. Numerous emetine compounds were tried. Emetine-bismuth-iodide was discarded as insoluble in ether oil. Emetine oleate appeared especially suitable ; it is a stable compound readily miscible with the initial solvent, whether olive oil or liquid paraffin, and

contains about 50 per cent. emetine, though it by no means follows that the efficacy of these preparations in destroying entamoebae or cysts depends entirely on the quantity of the drug.

For oral use several preparations are mentioned.

Emetine-bismuth-iodide is objectionable to patients, owing to a complex interaction in the stomach with the formation of emetine hydrochloride, bismuth oxychloride and the liberation of hydriodic acid.

It was to obviate these disadvantages that a periodide was made. *Emetine periodide* (C_{29} H_{40} N_2 O_4. 6I) contains 38·7 per cent. emetine and 61·3 per cent. iodine. Insoluble in water, it is readily soluble in alcohol, chloroform, ether and other solvents. On the analogy with other alkaloidal periodides the alkaloid would split off from the iodine atoms and leave the emetine molecule free for therapeutic activity. E.P.I. in the presence of acid liberates, practically speaking, *no* emetine. With regard to alkali, a third of the emetine is liberated in a couple of hours at body temperature under the influence of 5 per cent. caustic soda, a large proportion by 1 per cent. caustic soda, and a considerable proportion (one-ninth) by 2 per cent. sod. carb. in 10 minutes at body temperature. The conclusion is that the emetine contained in E.P.I. is not liberated in the stomach, whereas it must be when E.B.I. is administered.

P. H. M-B.

Panayotatou (A. G.). **Emétine et amibiase en Egypte.**—*Bull. Soc. Path. Exot.* 1923. Apr. 11. Vol. 16. No. 4. pp. 263–269.

Statistics are given showing that, in Egypt at any rate, in a population utterly devoid of hygienic principles, the systematic employment of emetine has diminished in a surprising manner the number of cases, not only of dysentery, but also of liver abscess. The figures are taken from two sources, the Hygienic Bureau in Alexandria and the Greek Hospital. In 1899 there were in Alexandria 68 deaths from abscess of the liver and 212 from dysentery ; in 1922 these figures were 4 and 82. In the Greek Hospital there were, in 1914, 40 cases of dysentery and 24 of liver abscess ; in 1922, 27 cases of dysentery are recorded and none of liver abscess. According to the laboratory statistics of the same hospital, *E. histolytica* is the principal cause of dysentery in Alexandria, being found in 59 per cent. ; the percentage ascribed to trichomonas appears to be small, about a tenth of that number.

P. H. M-B.

Le Roy des Barres (A.). **Colite et pericolite ascendante de l'angle droit du colon. Traitement par l'émétine. Guérison.**—*Rev. pratique des Maladies des Pays Chauds.* 1923. Feb. pp. 71–73.

Pericolitis, due to amoebic infiltration of the bowel, thickening of its coats and peritoneal adhesions, often accompanied by subacute suppuration, may resemble in its results a malignant tumour. Sometimes the growth may take on a rapid course and perforate.

A case of this nature is described in a lady who had been 25 years resident in Cochin and had frequently suffered from amoebic dysentery. The illness commenced with severe abdominal pains and her general

appearance suggested peritonitis. On palpation a painful, slightly moveable, tumour was discovered in the right upper abdomen. The sudden onset rather suggested an intussusception; in the faeces, however, numerous *E. histolytica* were found. The patient rapidly recovered on small doses of castor oil and emetine injections.

P. H. M-B.

MARCHOUX (E.). **Le stovarsol guérit rapidement la dysenterie amibienne.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 79–81.

The good effects in syphilis of Stovarsol (oxyaminophenylarsinic acid) given by the mouth have stimulated the author to try it in amoebic dysentery. In the first cases thus treated the cysts of *E. histolytica*, which had persisted after a course of emetine, rapidly disappeared, and also three patients having *coli* cysts were completely cured of this infection by the administration of 0·25 gm. twice daily in pill form. Success was equally remarkable in chronic cases of amoebic dysentery with passage of cysts; 20 pills given as a course (two daily) rapidly cured a case of four years standing, but at the end of three weeks, some ten days after the cessation of treatment, the entamoebae and cysts had reappeared and the "cure" had to be recommenced. Small doses are perhaps more efficacious; in some cases the author gives the drug in 0·25 gm. doses every second day for two months.

P. H. M-B.

HUPPENBAUER (K.). **Yatren und Amöbenruhr. Zu den gleichnamigen Veröffentlichungen von Dr.** E. BIRT- **Schanghai und Dr.** W. MENK- **Hamburg in Nr. 7 bzw. 10 d. Wschr. 1923.**—*Muench. Med. Woch.* 1923. May 11. Vol. 70. No. 19. p. 602.

Reports two more cases of chronic intractable dysentery successfully treated with Yatren. It was given in 5 per cent. solution in 200 cc. of water after previous clearance of the bowel by enemata. The Yatren lavage was retained for one hour. For after-treatment Yatren pills, each containing 0·25 gm., are recommended, taken 2–4 at a time on two consecutive days once a week [see this *Bulletin*, Vol. 20, p. 405].

P. H. M-B.

SNIJDERS (E. P.). **Plasmolysis in Amoebic Cysts.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 162–172. With 1 chart. [3 refs.]

It has long been known in botany that living protoplasm does not stain red in 2 per cent. solution of eosin, while KUENEN and SWELLENGREBEL have used this method for the detection of living cells in human stools, especially amoebae and amoebic cysts. Dead protoplasm does not always take up eosin readily, *e.g.*, if the cell wall is impermeable; therefore, staining with eosin is to be regarded always as a sign of death, but failure to stain is not always a sign of life.

From observations of this nature, and his failure to demonstrate the organism in the faeces of sucklings, the author is of opinion that Blastocystis is allied to the yeasts.

The cysts of *E. histolytica* show a decided form of plasmolysis. Using saline solution with a lower concentration than 2·5 per cent. NaCl. plasmolysis seldom occurred, but with 3 per cent. NaCl. nearly all the cysts, if not too old, plasmolysed. Before this occurs the cysts decrease in size, owing to the diffusion of water from the cell into the surrounding hypertonic saline. The form of this plasmolysis varies with different kinds of cysts ; in the case of *E. histolytica* and *E. coli*, the protoplasm parts from the cyst wall at a certain point and becomes crescentic in shape, while the cyst wall preserves its spherical form. The concentration requisite for initial plasmolysis is 2–4 per cent. NaCl. In the limax type the whole cyst shrinks, and the thick and apparently flexible cyst wall crinkles ; the concentration requisite for plasmolysis varies widely for different species of this type. The same cyst may be plasmolysed and deplasmolysed as many times as the observer likes, but when the cyst loses this power the protoplasm becomes more opaque and granular, and stains red with eosin ; both these symptoms, *i.e.*, loss of plasmolysibility and susceptibility to eosin, are signs of death. These are more useful signs than the results of infection with *E. histolytica* cysts in kittens.

P. H. M-B.

i. Kofoid (Charles Atwood) & Swezy (Olive). **Mitosis in *Endamoeba dysenteriae* in the Bone Marrow in Arthritis Deformans.**— *Univ. California Public. Zool.* 1922. Apr. 21. Vol. 20. No. 11. pp. 301–307. With 7 text figs. [14 refs.]

ii. Kofoid (Charles A.), Boyers (Luther M.) & Swezy (Olive). ***Endamoeba dysenteriae* in the Lymph Glands of Man in Hodgkin's Disease.**— *Ibid.* No. 12. pp. 309–312. With 4 text figs. [2 refs.]

i. In this preliminary note it is stated that the cells interpreted as amoebae [see this *Bulletin*, Vol. 19, p. 684] are really parasitic amoebae and are not amoeboid human cells.

The interpretation is based on the argument that mitosis in the Rhizopoda and Metazoa is of two distinct types, which cannot be confused by a trained protozoologist. In the mitosis of the human (metazoan) cell the nuclear membrane disappears, there is no "intradesmose" or deeply-staining strand in the spindle, and the number of chromosomes is much greater.

From the presence of the amoebae in the lesions of Ely's second or nonbacterial type of arthritis deformans the term amoebiasis of the bones would more accurately describe the disease.

The exact species may be *Councilmania lafleuri* [but see this *Bulletin*, Vol. 19, p. 20].

ii. Since publication of the last paper on this subject [*loc. cit.*, p. 685] a fourth case of Hodgkin's disease has been examined.

In the parts of the gland most affected the authors have found amoeboid cells with vesicular nuclei, which they interpret as parasitic amoebae by the line of argument used in the above paper.

P. H. M-B.

i. Coles (Alfred C.). **Acute Amoebic Dysentery in a Man who had never been out of England.**—*Brit. Med. Jl.* 1923. May 12. p. 809.

ii. Patterson (S. W.). **Amoebic Dysentery in Women.**—*Med. Jl. Australia.* 1923. Mar. 24. 10th Year. Vol. I. No. 12. p. 323. [4 refs.]

iii. Fischer (Walter). **Neue Ergebnisse der Amöbenforschung.**—*Klin. Woch.* 1923. Apr. 16. Vol. 2. No. 16. pp. 725–727.

iv. Hirai (Ikutaro). [**On Calomel Treatment of Infantile Amoebic Dysentery.**]—*Tokyo Iji-Shinshi* (*Tokyo Med. News*). 1923. Jan. No. 2311. [Summarized in *Japan Med. World.* Tokyo. 1923. May 15. Vol. 3. No. 5. p. 108.]

v. Ryle (J. A.). **Treatment of Liver Abscess by Aspiration.** [Correspondence.]—*Lancet.* 1923. May 19. p. 1026.

vi. Le Noir & de Fossey (Mathieu). **L'épreuve biliaire dans la dysenterie amibienne.**— *Arch. des maladies de l'appareil digestif et de la nutrition.* 1922. Vol. 13. No. 2. pp. 114–121.

i. A transport driver of the R.A.F. stationed at Uxbridge, Margate and Lee-on-Solent, contracted diarrhoea in February, 1922. Dysenteric symptoms supervened in August, 1922 ; the stools were typical of amoebic dysentery and the entamoebae were found by the author in November. The patient completely recovered on emetine-bismuth-iodide.

ii. During one week *Entamoeba histolytica* has been found in the faeces of two women who have always resided in Victoria. The first had suffered intermittently from slight attacks of diarrhoea for 20 years ; in the second case the illness commenced acutely.

iii. An uncritical review of the morphology of the intestinal amoebae ; no original observation.

iv. Calomel was used in infantile cases with success. The dose was either large, 0·02 gm., or small, 0·002 gm. ; the former was given two or three times, the latter several times in succession.

v. An ingenious approximation to aspiration of liver abscess was recommended by Aretaeus, the Cappadocian, in the second century A.D. Recognizing the characteristics of liver pus he advocated its evacuation by means of the cautery ; he was also familiar, it seems, with the diagnostic importance of pain in the right shoulder joint.

vi. See this *Bulletin*, Vol. 19, p. 688.

P. H. M-B.

Bacillary Dysentery.

Davison (Wilburt C.). **A Bacteriological and Clinical Consideration of Bacillary Dysentery in Adults and Children.**—*Medicine.* Baltimore. 1922. Nov. Vol. 1. No. 3. pp. 389–510.

This monograph embodies a very complete and detailed account of bacillary dysentery ; but original observations are meagre. Reviewing the occurrence of dysentery in war time, the author is of opinion that for its prevention in campaigns we are nearly as badly off as was Xenophon on his retreat from Persia.

Shiga's bacillus has a worldwide distribution. Of 35 cases of bacillary dysentery in children, the author found that 31 were due to Flexner and 4 to Shiga bacilli. In one child he isolated the Flexner bacillus from the urine. A negative culture is of no value in suspected dysentery. As to viability, the author has alternately frozen and thawed a saline suspension of Flexner bacilli daily for 33 days and found that they remained alive. He relies much on agglutination in diagnosis, using the Dreyer technique, but finds that living cultures vary from time to time in their agglutinability.

In discussing bacteriolysants as therapeutic agents, the treatment of twelve children by this method could not convince him that any benefit accrued. The Herelle phenomenon probably depends upon a bacteriolytic enzyme produced by bacteria, which not only dissolves bacteria but also favours the multiplication of bacteria that produce it.

In countries where amoebic dysentery is not endemic, a presumptive diagnosis of bacillary dysentery may be made in children who have had a sudden febrile attack and are passing bloody stools. The diagnosis in children is much simpler than in adults, for the intestinal reaction in the former is much more severe and consequently the stools consist almost entirely of blood and mucus. Treatment follows the well-recognized lines, but the author favours in the case of small children the intraperitoneal injection of salines or 5 per cent. dextrose.

[This is a very thorough review which must be read in the original; it has been compiled from papers already reviewed in this *Bulletin*; there are no less than 455 references on which a running commentary is made in the text, besides references to ancient history.]

P. H. M-B.

LORENTZEN (Werner). **Beitrag zur Pathogenese der Bacillenruhr.**—*Virchows Arch. f. Path. Anat. u. Physiol.* 1922. Dec. 30. Vol. 240. No. 1–2. pp. 184–202. [73 refs.]

This report, based upon a study of war material (16 cases), is replete with pathological details, many of interest to the profound student of pathology.

The character of the pathological anatomy of bacillary dysentery would seem to depend upon whether the changes are produced solely by the specific dysentery bacillus or are in any way influenced by a secondary invasion, or possibly a mixed infection by organisms of the *Bacillus coli* group. The primary seat of the bacillus and the path of invasion are both moot points. It is generally admitted that the process begins in the large intestine and most often in the lower segments. On account of this fact BENEKE suggested that the anus was the usual path of entry. It is quite certain that the bacilli gain entrance through the intestinal mucosa and not *via* the blood or lymph streams. The exact action of the organisms upon the tissues is again difficult to understand for there appears to be no unanimity whether the specific effect is produced either by an *endotoxin* or an *exotoxin*.

The bacteriology of these cases was undertaken by GROSS, who has found dysentery bacilli so regularly in the bowel at recent autopsies that there is little probability that other organisms can give rise to similar pathological changes; furthermore, that they may disappear very speedily from the bowel from the eleventh to sixteenth day of the disease. Very exceptionally are they to be found in the apparently healthy jejunum. Shiga-Kruse bacilli appear to be confined solely to the bowel wall, but the non-toxic varieties can be found in the liver, spleen and mesenteric glands. As a general rule, fatal cases are due to the Shiga-Kruse bacillus, but occasionally the so-called non-toxic strain may be able to produce lesions every bit as severe. The bowel attacked by *B. dysenteriae* is very prone to mixed infections of all kinds; it may be *B. coli*, Streptococci or *B. paratyphosus* B.

The following questions remained to be answered :—

1. What are the characteristic lesions of a primary bacillary dysentery ?
2. How do they progress ?
3. The situation of the bacilli.
4. At what stage does a secondary infection ensue ?
5. Are changes characteristic of bacillary dysentery produced in the lymphatic glands and in the liver ?
6. Can the Shiga-Kruse dysentery be differentiated from pseudo-dysentery (Y and Flexner) ?

In four cases of the series Shiga-Kruse bacilli were isolated from the bowel wall ; in one they were found in the stomach and small intestine, but not in the colon ; in five others the blood agglutinated this bacillus ; in three cases Y bacilli were obtained and in one Flexner. In one case there was a well marked secondary infection and another died of dysentery while suffering from a primary influenza. The earliest changes were seen in patients who during life had suffered for one or two days from symptoms of dysentery. In these it appears that bacillary dysentery commences as an inflammation of the superficial layers of the mucosa, passing on to hyperaemia and diapedesis into the interstitial tissues, together with oedema of the mucosa and submucosa till a fibrinous exudate is produced. In the intestinal cells the dysentery organisms are visible, lying in small clumps or singly, it may be, engulfed by wandering leucocytes. Occasionally the Lieberkühn's crypts are filled with exuded phagocytes, but for the most part their lumen is constricted by surrounding pressure. The lymphoid follicles appear to be specially affected, containing necrotic foci and accumulations of polymorphs. There is no evidence that collections of lymphoid tissue constitute the starting point of the dysenteric process, for no organisms were seen in these situations. On the other hand, it is probable that peculiarly attenuated epithelium covering these follicles is the first to be attacked. In the later stages there is still further destruction of the mucosa, the glands are destroyed and the fibrinous exudate increases. The muscularis mucosae remains and is usually spared, though infiltrated. The ganglion cells show toxic changes. At the end of the third week actual ulceration commences ; sometimes extending as far as the muscularis, at others deeper to the uppermost fibres of the muscular coat. The margin of these ulcers is formed of mucous membrane showing inflammatory changes and even small haemorrhages. At the end of the fourth week the ulcers may have extended as far as the serosa ; on the contrary, the lumen of the mucosa glands is distended and the columnar cells themselves exhibit mitotic activity. In the unaffected regions of the submucosa the tissue is packed with fibroblasts, connective tissue and plasma cells.

Changes in the ileum.—The extension of the inflammatory process to the ileum is frequently found. Even when appearing to be normal macroscopically hyperaemia and other changes are visible on microscopic examination. However, in spite of their appearances, no bacilli were visible, nor were they recoverable on culture.

Several points of interest emerge from this study. The author finds evidence of regeneration of the columnar epithelium, for even beneath the scar-tissue cells with mitotic nuclei are always visible, clearly showing that the mucosa itself is regenerated from the fundus of the follicles. Even in the necrotic area collagenous and elastic

fibres appear to escape as do also the smaller arteries. A point not previously referred to is the effect upon the ganglion cells of the Meissner and Auerbach plexuses ; these are damaged, but are seldom destroyed unless involved in a zone of necrosis, and it is possible that this aspect of the subject affords some explanation of disordered mechanism of the bowel which persists for some time after the lesions of bacillary dysentery have healed.

The mesenteric lymph glands show marked tissue reaction and phagocytosis of cell detritus, occasionally also of red blood corpuscles and leucocytes. In one instance the Flexner bacillus was isolated in pure culture. The absence of any decided pathological changes in the liver is remarkable, when one considers the tissue disturbance which had taken place throughout the portal area.

P. H. M-B.

Zlatogoroff (S. J.), Gorodkowa (A. A.) & Karetnikowa (W. W.). **Zur Aetiologie der Ruhr, mit besonderer Berücksichtigung der Ruhrepidemie von 1920 in Petersburg.** [Etiology of Dysentery, with Special Reference to the Epidemic of 1920 in Petrograd.]—*Cent. f. Bakt.* I. Abt. Orig. 1923. June 28. Vol. 90. No. 5. pp. 316–322. [18 refs.]

The Petrograd epidemic commenced in June, 1920, and within six months 4,431 cases were recorded with 846 (19 per cent.) deaths. The morbidity curve reached its maximum in summer and autumn. The organisms responsible were of four varieties ; the most common were bacilli of Shiga and Flexner, though the Hiss-Russel and Strong's bacillus were also represented. A large proportion of clinical cases could not be confirmed bacteriologically ; in these, organisms closely allied to the dysentery group were isolated, such as B. Kulescha-Titoff, B. para-Shiga and B. para-Flexner.

Bacteriological investigations were confined to blood-and-mucus stools and post-mortem material. Altogether 708 cases, including 355 stools and 24 intestines post-mortem, were examined. In 297 cases no scientific diagnosis could be made ; in 119 strains of different dysentery bacilli were present : 58 were Shiga, 23 Hiss-Russel, and 42 Flexner.

The protozoological investigations (protozoa (?) species were demonstrated on 65 occasions) were undertaken by Yakimoff.

P. H. M-B.

Kreuser. **Erfahrungen aus der Ruhrepidemie von 1914–1920 in den Kreisen Saarbrücken und Saarlouis.** [The Dysentery Epidemic of 1914–20 in the Saarbrucken and Saarlouis Districts.]—*Ztschr. f. Hyg. u. Infektionskr.* 1923. Vol. 99. No. 2. pp. 166–185. With 3 text figs. [34 refs.]

A historical review of dysentery in Germany in recent times shows that few if any cases were noted in the war of 1864 against Denmark or that of 1866 against Austria ; but in the Franco-Prussian war of 1870–71 a large epidemic is recorded with 36,652 cases and 2,380 deaths, the majority of cases occurring in and around Metz in mid-summer and early autumn. Since that date the disease has never quite disappeared from Alsace-Lorraine. It is difficult to estimate how far the disappearance of the disease from the rest of Germany

is attributable to improved hygiene and how far to progress in bacteriology. In ordinary times epidemics of dysentery exhibit a distinct seasonal prevalence, except in confined populations, such as institutions and lunatic asylums. Observations from 1914–20 in the Saarbrucken area show that the epidemic begins at the end of June and reaches its maximum in August or September. The banishment of dysentery is mainly a hygienic problem, but in spite of advances in hygiene the disease has never left Metz or Poland. The author believes that in this very infectious disease the main vector is the house-fly, that it is spread in an epidemic manner by movements of people, and is fostered from year to year by healthy carriers and convalescents, and kept up specially by babies and small children who readily contract the infection.

P. H. M-B.

Beare (F. H.). **Bacillary Dysentery in Children.**—*Med. Jl. Australia.* 1923. Mar. 31. 10th Year. Vol. 1. No. 13. pp. 340–350. [24 refs.]

The Year Book of the Commonwealth of Australia contains no entry of bacillary dysentery as a cause of death and yet many individuals die annually from this cause. The disease is not yet recognized as common in Australia.

In Adelaide Children's Hospital, of 207 cases of diarrhoea the stools in 38 per cent. contained blood and mucus. The majority of babies contracting bacillary dysentery were fed on cow's milk; only five, or 7 per cent., were totally breast-fed. The influence of faulty feeding on the incidence of the disease was clearly proved. Flexner's bacillus was the organism most frequently isolated; Shiga's bacillus was not obtained. The probability of isolating the organism from the stools decreases as the case progresses; up to four days it was obtained in 82 per cent., but a period of 28 days proved to be the limit.

Case to case infection does not appear to be uncommon, for 63 per cent. of patients in this series had previously been associated with another case of diarrhoea. Though dependence was not absolutely proved, the association of the cases with horses heavily infested with flies was close, and in 41 out of 51 the infection originated in proximity to a yard or stables in which horses were kept.

One of the most constant prodromal signs was drowsiness, and the disease itself is ushered in with severe diarrhoea, which may be accompanied by vomiting. The clinical picture is, as a rule, one of severe toxaemia. The course of the disease is generally short. The child, instead of being drowsy, becomes lively and more like normal. Death may take place at any time and out of this series 26 died—a mortality of 33 per cent.; not uncommonly it is due to terminal bronchopneumonia. Dysenteric arthritis of the knee occurred in one case only. There was one death from pyelo-nephritis. In quite half the cases, at autopsy, otitis media was present.

As regards treatment the dosage of antidysenteric serum (prepared from all races of Flexner's bacillus V–Z) has been as follows:—In children under 2 years 10 cc., in those over 2 years 30 cc., subcutaneously daily for 4 days. The mortality amongst 31 patients treated with serum was 5, *i.e.*, 16 per cent., while amongst 58 patients not treated with serum it was 21, *i.e.*, 36 per cent. A table is given of details and results of treatment.

P. H. M-B.

KUHLE (Willi). **Erfolge prophylaktischer und therapeutischer Impfungen mit Ruhrserum.** [Preventive and Therapeutic Administration of Anti-Dysentery Serum.]—*Deut. Med. Woch.* 1923. May 18. Vol. 49. No. 20. pp. 645–646. [6 refs.]

A small epidemic of bacillary dysentery in infants is here recorded. The first case occurred suddenly in a breast-fed infant; the second, which proved fatal, ten weeks later. Subsequently 13 other cases occurred in the clinic. The bacillus responsible appeared to be Flexner-Y. The 23 remaining infants which had up to that time escaped infection were injected subcutaneously with 10 cc. polyvalent antidysenteric serum. The 13 dysenterics were treated in the same manner with the same dosage and speedily recovered. The most suitable dietary was found to be whey. A serum-rash supervened in three instances. The author considers that the antidysenteric serum exerts a distinct prophylactic effect.

P. H. M-B.

i. DE FARIA (Gomes) & PACHECO (Genesio). **A proposito da dysenteria bacillar no Rio de Janeiro.** [Bacillary Dysentery in Rio de Janeiro.]—*Brazil Medico.* 1923. Apr. 7. Year 37. Vol. 1. No. 14. pp. 187–189.

ii. LINS (Abdon). **Considerações sobre a dysenteria bacillar do Rio de Janeiro.**—*Ibid.* Apr. 21. No. 16. pp. 215–217.

iii. DE FARIA (Gomes) & PACHECO (Genesio). **Ainda duas palavras sobre a dysenteria bacillar no Rio de Janeiro.** [Further Remarks on Bacillary Dysentery in Rio.]—*Ibid.* June 9. No. 23. pp. 313–314.

i. The research detailed in this paper was instigated by the announcement of LINS that Morgan's bacillus and an organism which he named *Escherichia braziliensis* were the causes of dysentery in Rio de Janeiro. The authors found that in 20 per cent. of cases of diarrhoea in children and in 32 per cent. of adult patients examined one or other types of *B. dysenteriae* were present, and that from 50 per cent. of diarrhoeic stools of children Morgan's bacillus was isolated, but this was met with also in normal stools of children. The authors declaim against the practice of baptizing every coli-like organism with a new name.

ii. Dr. Lins states that in naming his bacillus he had been guided by the table of coli-like organisms given by CASTELLANI and CHALMERS.

iii. After further investigations, the authors maintain that in a large majority of cases of dysentery one or other of the recognized bacilli can be isolated—Shiga-Kruse, Flexner, Hiss and Russell, etc.—and that the organism isolated by LINS is merely a variety of *B. coli*, of no etiological significance [see this *Bulletin*, Vol. 20, p. 408].

H. Harold Scott.

LICHTENSTEIN (A.). **Chronic Bacillary Dysentery.**—*Meded. Burgerlijk. Geneesk. Dienst in Nederl.-Indië.* 1922. Pt. 4. pp. 268–279. [8 refs.]

The author believes that chronic bacillary dysentery is not necessarily a serious disease; at the military stations of Weltevreden and Meester Cornelis it usually does not undermine the patient's constitution. The disease is generally due to the atoxic strains of the bacilli, though

the Shiga-Kruse organism may also produce it. The agglutination test can be used for diagnosis only if the titre is above 1 : 200. In treatment the injection of auto-vaccines has little or no effect, but as a protection in time of war soldiers should be inoculated with Boencke's dysbacta.

P. H. M-B.

Shaw (B. H.). **Infection in Mental Hospitals, with Special Reference to Floor Treatment.** [Dysentery. Tuberculosis.]—*Jl. Mental Sci.* 1923. Jan. Vol. 69. No. 284. pp. 24–45. [12 refs.]

In March, 1922, a number of tubes, each containing about 5 gm. of sterile earth, were inoculated with B. Flexner; some of the tubes contained dry earth, the remainder moist; some were placed in daylight, others in a dark cupboard.

The organisms in the dry tubes were all dead at the end of the fourth week, whether exposed to sunlight or not. Desiccation, sunlight and heat are the most effective means of destroying the Flexner bacillus. Basing his work on these experiments and published reports upon the carrier rate in bacillary dysentery, the author has reached the following conclusions :—

Recent cases of dysentery should only be considered recovered when negative laboratory returns for one month coincide with clinical recovery in that period.

Should dysentery break out in a ward, the stools of all contacts should be examined bacteriologically twice weekly for a period of four weeks after the isolation of those affected, while the faeces of all patients who have ever had dysentery should be examined bacteriologically once a week for a period of three months.

The detection of a Flexner carrier is more difficult than that of a Shiga, for the former is generally in good health and suffers little inconvenience. The organism may also appear in the faeces intermittently.

The possibility of soil-pollution should be considered, as well as the rôle of flies as possible carriers. No patient who has ever had dysentery should be permitted to work in the kitchen or be employed in handling food. All polished floors should be scrubbed at frequent intervals. Should dysentery occur the polished floor should be scrubbed at least three times a week for a month. In order to reduce infection to a minimum the installation of a central vacuum cleaning system is desirable.

P. H. M-B.

Bolton (J. Shaw) & McGrath (M. J.). **Asylum Dysentery and Allied Infections (Further Report).**—*Eighth Ann. Rep. of the Board of Control for the Year 1921. Lunacy and Mental Deficiency.* pp. 87–92. 1922. H.M. Stationery Office.

During 1921 six cases of dysentery occurred in the West Riding Mental Hospital from which Flexner's bacillus was isolated, three cases of typhoid fever and one of paratyphoid. Fifty-seven faecal specimens were examined and Flexner's bacillus isolated from nine. The authors consider it impossible, without employing bacteriological methods, to diagnose between dysentery, typhoid, paratyphoid and ordinary diarrhoea. Whenever active dysentery occurs numerous

positive agglutination results can be obtained amongst possible contacts. During the period under review 589 patients and members of the staff have been vaccinated against dysentery, the routine dose being 1,000 millions followed in ten days by a further 2,000 millions. In no instance have troublesome complications ensued and, as a rule, little discomfort. With two exceptions, both of whom had previously suffered from dysentery, not a single inoculated case developed the disease.

P. H. M-B.

Olitzki (Leo). **Bericht ueber den Verlauf einer Y-Ruhr-Epidemie in der städtischen Heilanstalt für Nerven- und Gemütskranke zu Breslau.** [Epidemic of Y Dysentery in the Municipal Mental Hospital at Breslau.]—*Cent. f. Bakt.* I. Abt. Orig. 1923. May 4. Vol. 90. No. 4. pp. 262–264.

The Asylum at Breslau is composed of six blocks, three for each sex, and the patients are not permitted to intermingle in any way. Cases of bacillary dysentery in 1922 were confined solely to the female side. They continued to crop up in various blocks, so that the possibility of a carrier being concerned was mooted. From one nurse the Y bacillus was recovered from the faeces, and in 20 others the serum agglutinated this organism.

P. H. M-B.

von Werdt (F.). **Die pathologische Anatomie der chronischen Ruhr. I. Teil. Die makroskopisch erkennbaren Veränderungen.** [Morbid Anatomy of Chronic Dysentery. Naked Eye Changes.]—*Frankfurter Ztschr. f. Path.* 1922. Vol. 28. Pt. 3. pp. 378–406.

The material was derived from autopsies on soldiers who died from bacillary dysentery during the war. The author describes both the macroscopic and microscopic pathology of the bowel in the acute and chronic stages of the disease, and the descriptions do not differ in any way from those generally accepted. In the chronic stage he observed perforation of the appendix twice, with consequent peritonitis. There is an extensive bibliography.

P. H. M-B.

Cutter (Robert K.). **Bacillary Dysentery. Report of Case, with a Study of the Intestinal Bacteriophage.**—*Jl. Amer. Med. Assoc.* 1923. June 9. Vol. 80. No. 23. pp. 1674–1675.

The case of accidental infection with bacillary dysentery here reported is interesting since the infecting organism is known, the time of infection and the incubation period, while the carrier state supervened.

The author infected himself in October, 1922, when filtering a culture of *B. dysenteriae* (Flexner); there were no symptoms for 28 hours after the accident, when after preliminary chilly sensations clinical dysentery set in. Blood and mucus stools persisted for seven days and from each the Flexner bacillus was cultured. It was again isolated after the faeces had been normal for a week. The serum agglutinated a stool culture of *B. dysenteriae* in a dilution of 1 : 80 on the eighth day; this persisted for 1½ months. Filtrate from the faeces showed the Flexner bacteriophage from the fourth to ninth day, but it was not present 21 days after the onset. This bacteriophage was active against *B. dysenteriae* (Shiga) and *B. coli* as well.

P. H. M-B.

VAN NITSEN (R.) & MORTIAUX (Ch.). **La rhubarbe dans les dysenteries bacillaires.**—*Ann. Soc. Belge de Méd. Trop.* Brussels. 1923. May. Vol. 3. No. 1. pp. 1–4.

Two Europeans and 14 natives suffering from bacillary dysentery were treated with rhubarb according to BURKITT's method [see this *Bulletin*, Vol. 19, p. 41]. The results were very satisfactory and superior to those obtained by use of antidysenteric serum. On account of its simplicity, cheapness and convenience, the authors consider rhubarb to be a most valuable remedy in the treatment of this disease.

P. H. M-B.

GUIMARÃES (Aristides). **Bacteriologia e vaccinotherapia da dysenteria.** [Vaccine Treatment of Dysentery.]—*Bol. Soc. Med. e Cirurg. de S. Paulo.* Brazil. 1922. Feb. Vol. 4. 2nd Ser. No. 12. pp. 342–343.

In an outbreak of dysentery, in which the Shiga bacillus was found, prevalent between October, 1921, and February, 1922, a mixed vaccine of dysentery, coli, and staphylococcus organisms was employed with excellent results. For some of the cases, during the first three months, anti-sera were also used. The doses of the vaccines comprised 100 to 600 millions of the Shiga organism, 100 to 800 of the coli, and 100 to 200 of the staphylococcus. Further details are not recorded.

H. Harold Scott.

COMBIESCO (D.), MAGHERU (Alice) & CALALB (G.). **Vaccination préventive contre la dysentérie, par la voie digestive, chez le lapin.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 904–906. [2 refs.]

It is possible to protect rabbits against dysentery by administration of cultures by the mouth, but the results obtained are inconstant. With the same dose some rabbits become protected, whilst others die. Immunization may occur after small doses ; in other instances none is produced with large ones.

The serum of the animal immunized *per os* contains neither agglutinins nor precipitins, while possessing considerable antitoxic power and thus proving that dysenteric toxins can traverse the mucous membranes. Many of the animals develop a toxic paralysis. On the whole, it may be said that inoculation *per os* produces a general as well as a local immunity.

P. H. M-B.

BALTEANO (I.). **La vaccination antidysentérique par la voie cutanée chez les lapins.**—*C.R. Soc. Biol.* 1923. Apr. 14. Vol. 88. No. 12. pp. 943–944.

It has already been shown by PETRUSCHKY* that it is possible to immunize man against dysentery by rubbing emulsions of dysentery bacilli into the skin. For the present experiments rabbits were employed. The skin was shaved and a dense emulsion of Shiga's bacillus rubbed in vigorously. This operation was followed shortly

* PETRUSCHKY (J.). Erfahrungen über percutane Schutzbehandlung bei Ruhr.—*Med. Klinik.* 1919. Vol. 15. p. 864.

by desquamation of the epidermis ; a scab formed which was shed 7–8 days afterwards. Two rabbits succumbed and an inflammatory condition of the bowel was found at autopsy. It was proved that the specific agglutinins appeared in the serum, while the animals developed a very considerable immunity and could tolerate the intravenous injection of 2 cc. of an emulsion of Shiga's bacillus, of which 0·5 cc. was fatal to the untreated control animal. The author believes that this is an easy and rapid method of producing immunity.

P. H. M-B.

Widowitz (Paul). **Ueber Dysenterieagglutinationen bei Kindern.**— *Wien. Klin. Woch.* 1923. Mar. 22. Vol. 36. No. 12. pp. 220–221.

The author investigated the serum of 175 children to test the so-called normal agglutination, that is the power of which the serum of apparently normal individuals is possessed to agglutinate dysentery bacilli, especially the Flexner-Y strain. He concludes that the formation of agglutinins specific for Flexner-Y denotes an infection with these organisms and agglutination implies the persistence of residual agglutinins. Should co-agglutination with other closely allied organisms take place, it denotes that an infection with these organisms has also taken place, it may be in the early years of life.

P. H. M-B.

McCartney (James E.) & Olitsky (Peter K.). **Separation of the Toxins of *Bacillus dysenteriae* Shiga.**— *Jl. Experim. Med.* 1923. June 1. Vol. 37. No. 6. pp. 767–779. [13 refs.]

According to Olitsky and Kligler, the poison of *B. dysenteriae* Shiga can be separated into a true soluble exotoxin and an endotoxin, the product of autolysis or disintegration [see this *Bulletin*, Vol. 16, p. 18]. The exotoxin has a specific action on the central nervous system of the rabbit ; the endotoxin affects only the intestinal tract. The cultures used in these experiments were the same strain of bacillus as was employed by the observers already quoted. The experiments showed that Shiga bacilli, when grown in a well aerated medium, form in one to three days a soluble toxin which can be recovered from bacteria-free filtrates. This exotoxin acts upon the central nervous system of the rabbit, producing haemorrhages and necrosis in the medulla and upper part of the cervical cord, but it is entirely without effect upon the intestinal tract. On the other hand, autolysates of the bacteria produce similar nervous lesions, and also affect the intestinal mucosa.

The exotoxin can be produced in a pure state, but endotoxin or enterotoxin, which is the result of bacterial disintegration, is always mixed with exotoxin. By anaerobic methods the neurotoxin-producing activity can be suppressed, by growing the organisms in fluid medium either under a petrolatum seal or in an anaerobic jar. Shiga bacilli, when grown in fluid medium contained in a sac implanted intra-abdominally, survive and multiply for at least one month. Rabbits show the results of dialysis within five days after implantation ; the animals die of absorption of exotoxin with lesions in medulla and cord. Rabbits harbouring sacs of a lesser degree of permeability produce a higher titre of agglutinins in their blood. The contents of

the sacs after one month *in abdomine* are highly toxic for normal rabbits and immunity is produced to subsequent injections of both exotoxin and endotoxin.

The work of Olitsky and KLIGLER with regard to the biological and physical differences of these two toxins is hereby confirmed. The practical outcome of this work concerns the preparation of an effective antidysenteric serum which should contain both endotoxic and exotoxic antibodies. The intravenous injection into horses of live Shiga bacilli has yielded a serum containing 2,000 anti-exotoxic units per cc., as well as endotoxic and bacterial antibodies. The anti-infectious potency is such that 0·008 cc. protects rabbits against two lethal doses of Shiga bacilli.

P. H. M-B.

YOSHIOKA (Masaaki). **Ueber das Bakteriengift, insbesondere die löslichen Gifte des Dysenterie-, Typhus- und Paratyphusbazillus. (III. Mitteilung.)** [Bacterial Toxin, especially the Soluble Toxins of the Dysentery and Enterica Bacilli.]—*Ztschr. f. Immunitätsf. u. Experim. Therap.* I. Teil. Orig. 1923. May 15. Vol. 36. No. 5–6. pp. 395–418. [2 refs.]

The soluble toxins of typhoid, paratyphoid, and dysentery bacilli have been the objects of frequent study. The most potent toxin of typhosus broth (in 0·5 cc. doses) kills a rabbit of 800 gm. in 24 hours. In order to produce this powerful toxin it is necessary to select the best strain and subculture it on the optimum medium, which consists of Fukuhara's solution with 1 per cent. Witte's peptone bouillon. Rabbits above 1,600 gm. are more susceptible to typhoid toxin than rabbits below that weight, and guinea-pigs are much less susceptible than rabbits. The acutely (intravenous) poisoned rabbit dies in a few minutes; in chronic poisoning the animal becomes emaciated. It is easy to demonstrate the presence of toxins in the broth filtrate of a dysentery culture.

P. H. M-B.

i. COURMONT (Paul) & ROCHAIX (A.). **Variations *in vitro* de la fermentation des "sucres" par les bacilles du groupe dysentérique.**—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 784–786.

ii. —— & ——. **Variations de la fermentation des "sucres" par les bacilles dysentériques sous l'influence du "co-entraînement."**—*Ibid.* pp. 786–788.

i. The authors explain their method of "educating" the classical strains of dysentery bacilli to ferment sugars which they do not normally ferment. The medium employed consisted of 2 per cent. peptone water containing 1 per cent. of the sugar and litmus as an indicator.

Shiga's bacillus was cultivated continuously for four months on the following substances, which it does not normally ferment:—saccharose, lactose, maltose, galactose, sorbite, xylose, glycogen, dulcite, inulin, dextrine, amidon and inosite. At the end of ten days the bacillus acquired the power of fermenting galactose, a property which became permanent. Glycogen fermentation was acquired at the end of two months; inosite at three and a half months; but no fermentation of the other substances was observed. Flexner's bacillus treated in the

same manner fermented glycogen at the end of two, and sorbite at the end of three months. Hiss' bacillus acquired the power of fermenting saccharose in three months and sorbite in four. After some time maltose was fermented, a property which persisted subsequently. Strong's bacillus acquired the power of fermenting mannite and glycogen.

ii. A bacillus subcultured from a normal type stock, when cultured in a medium containing non-fermentable sugar, almost invariably ferments it by a process known as "entraînement." This newly-acquired property is temporary, but sometimes it can be transmitted for several generations as mentioned above.

P. H. M-B.

Tanaka (A.). **On a Non-Acid B. Dysentery.**—*Japan Med. World.* Tokyo. 1923. Apr. 15. Vol. 3. No. 4. pp. 74–77.

A dysentery bacillus, in many ways resembling the organism described by Schmitz, was isolated in almost pure culture from two patients with dysentery and three with mild diarrhoea. This bacillus does not ferment mannite, but produces indol; like the Schmitz bacillus, it is only slightly toxic to rabbits, but is agglutinated in high titre by the patients' serum and is also clumped in low dilutions by Shiga serum and other dysenteric sera. *Per contra* the immune serum of this organism agglutinates feebly the already recognized strains of dysentery organisms.

P. H. M-B.

Olivi (G.). **The Virulence of** *Bacillus metadysentericus* **(Castellani) in the Rabbit. Its Resistance to the Action of Sunlight.**—*Jl. Trop. Med. & Hyg.* 1923. Apr. 16. Vol. 26. No. 8. pp. 123–124.

This bacillus resembles morphologically the classical organisms, but produces acid from many sugars, including lactose. It does not appear to be especially toxic to rabbits. Usually abscesses appear at the point of inoculation. An homologous serum can be produced, though the toxin appears to be similar to that of the Shiga-Kruse type as does the inflammation of the gut which results.

P. H. M-B.

Flu (P. C.). **Het gedrag van een inagglutinabele Bacterium Flexner tegenover bacteriophagen anti-Flexner.**—*Tijdschr. v. Vergelijkende Geneesk. enz.* Leiden. 1923. Apr. 28. Vol. 8. No. 4. pp. 234–246. [English summary, pp. 247–248.]

——. **Das Verhalten eines inagglutinablen Flexner-Bakterium gegenüber Anti-Flexner-Bakteriophagen.**—*Cent. f. Bakt.* I. Abt. Orig. 1923. June 28. Vol. 90. No. 5. pp. 374–381.

From the intestine of a sprue patient an organism was obtained which showed all the properties of a Flexner bacillus except that it was not agglutinated by a Flexner anti-serum. This property remained constant after frequent subinoculations on agar. In spite of this, Flu considers the bacillus was a true Flexner, for, in the presence of an anti-Flexner serum, it fixed complement, and when injected into rabbits it produced a Flexner-agglutinating serum of a very high power.

Furthermore, this strain was quite resistant against bacteriophages having strong lytic qualities against other Flexner and Shiga strains. It was able to enter into combination with an anti-Flexner bacteriophage, either in the living or killed state. The inhibiting of the bacteriophage by this strain is probably due to the destruction of this substance by the living protoplasm of the bacillus.

P. H. M-B.

Lisbonne (M.) & Carrère (L.). **Obtention du principe lytique pour le Bacille de Shiga par culture filtrée de** *B. coli.*—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 724–726. [4 refs.]

A lytic principle for Shiga's bacillus can easily be obtained by growing this organism in association with *B. coli*, but not with *B. pyocyaneus*, the staphylococcus or the cholera vibrio. A culture of *B. coli* is incubated in bouillon for five days and filtered through a Chamberland L.3 bougie ; 30 drops are then added to a fresh suspension of Shiga's bacillus in 9 cc. bouillon and again incubated for four days. At this stage the Shiga bacteriophage makes its appearance and can be reinforced by successive " passages."

P. H. M-B.

Mixed and Unclassed Dysentery.

Ash (J. E.). **Dysentery, with Reference particularly to the Laboratory Diagnosis, Epidemiology and Treatment.**—*Milit. Surgeon.* 1923. May. Vol. 52. No. 5. pp. 455–509. [12 refs.]

The author believes that a great many errors in the diagnosis of dysentery are still perpetrated. The Day of Judgment will see a mighty phalanx marshalled of those who succumbed to bacillary dysentery and were so unfortunate as to harbour at the same time one or other of the non-pathogenic amoebae and to be treated with emetine by the conservative physician who regards all amoebae as pathogenic ; there will also be a great many others in whom endothelial macrophages were mistaken for amoebae by the incompetent microscopist.

It has fallen to the author to enquire into so-called " epidemic amoebic dysentery," and he has failed to reach any conclusion that would vitiate the generally held view that amoebic dysentery does not become epidemic. There is little doubt that bacillary dysentery is more common in the United States than is generally recognized, and numbers of cases are incorrectly diagnosed and consequently mistreated. Most of the mistakes in the outbreaks the author has had to investigate have arisen from non-appreciation of the niceties of laboratory technique and ignorance of protozoology and cellular pathology. The examinations in many instances were relegated to an inexperienced orderly.

Bacillary dysentery shows a seasonal incidence in Manila, the curve culminating during the period of heavy rains. If, through mistaken diagnosis, mild bacillary cases are treated with emetine they usually do well, notwithstanding lack of specific treatment, thereby leading

to the erroneous conclusion that the etiology of the condition has been established by a therapeutic test. Bacillary dysenteries of this type bear a close clinical resemblance to amoebic dysentery. The burden of establishing the final diagnosis rests upon the microscopist. To the untrained eye a large endothelial cell, particularly if it contains erythrocytes, immediately becomes an amoeba, and the fact that the microscopic field is strewn with necrotic epithelium and leucocytes conveys no suspicion that the process is bacillary.

It is highly probable that a considerable number of determinations of cysts of *E. histolytica* and *E. coli* made in laboratories are incorrect. In bacillary dysentery polymorphonuclear leucocytes are able to undergo karyorrhexis in which the chromatin breaks up into two or more annular bodies readily mistaken for nuclei of the amoeba type and consequently the leucocyte is identified as a cyst.

Serological results must be accepted with reserve ; experience shows that not a great deal of dependence can be placed on immunological reactions as a diagnostic test in bacillary dysentery. It frequently happens that during the active stage of the infection agglutinins are absent from the blood serum.

As regards carriers of *E. histolytica* the author is of opinion that there is no evidence at present that persons suffering from acute amoebic dysentery are able to transmit it to others. The dissemination is carried out by those who may never have suffered from even the slightest dysenteric symptoms—persons who may have harboured the organism for months or even years and are daily discharging in their stools great numbers of cysts, impossible of detection by any but microscopical methods. Unencysted amoebae leaving the intestine of man are incapable of infecting other people and quickly perish.

As illustrating the method of carrying out an investigation into the relation of the human carrier to dysentery, the following data are given of the examination of 375 food handlers on duty in various messes of the organizations where the " epidemic " of amoebic dysentery is said to have occurred. Of the 375 men (185 Filipinos, 140 Americans, and 50 Chinese), 290, or 77·3 per cent., were found to harbour one or more intestinal parasites ; 5·6 per cent. infections with *E. histolytica* were detected, apportioned as follows :—Americans 4·1 per cent., Filipinos 6·4 per cent., Chinese 6 per cent. Hookworm infections amounted to 39·7 per cent. of the entire number ; infections with *Trichuris trichiura*, 41 per cent. Six American food handlers were found infected with *E. histolytica*, and *none had ever previously suffered from dysentery*. The incidence of *E. histolytica* was scarcely high enough to warrant the assumption that they were spreading the infection to any considerable extent.

It is questionable whether it is necessary to examine the food handlers every month when the sanitation is good. Rather it would be better that such examinations be made less frequently, even only twice a year, but with greater thoroughness.

[This critical and instructive review of the fallacies that beset the diagnosis and treatment of dysentery in military organizations, or in private practice, common fallacies familiar to all who are interested in this subject, should be read in the original by those who are responsible for the direction of medical services in districts where " clinical dysentery " is rife.]

P. H. M-B.

Watson (G. A.). **Report on Dysentery for the Year 1921.**—*Eighth Ann. Rep. of the Board of Control for the Year 1921. Lunacy and Mental Deficiency.* pp. 80–81. 1922. H.M. Stationery Office.

In the Lancashire County Mental Hospital 111 cases occurred, including one member of the male nursing staff. In 4 out of 41 cases of true dysentery, active forms of *E. histolytica* were found, *i.e.*, in 9·8 per cent. The remaining 37 were bacillary in origin, the Flexner Y and Flexner bacilli being found in 25 and 4 and the Shiga-Kruse bacillus in 6.

In 3 cases out of 313 new admissions, or nearly 1 per cent., the cysts of *E. histolytica* were discovered, and in 1 the Y strain of Flexner bacillus was isolated, but he had previously suffered severely from the disease.

P. H. M-B.

Shearman (C. H.). **The Dysenteric Infections in Australia.**—*Med. Jl. Australia.* 1923. June 2. 10th Year. Vol. 1. No. 22. pp. 604–609. [8 refs.]

Dysentery was formerly considered not to be endemic in Australia. Considerable epidemics of bacillary dysentery have recently been reported and in this paper are summarized authentic records of amoebic dysentery and liver abscess in Australia. *E. histolytica* is not uncommon in the eastern goldfields. In 1922 the medical officer at Kalgoorlie reported 12 cases of hepatic abscess. The faeces of one of these was found to contain cysts of *E. histolytica*. Three patients with a similar infection were found in the Kalgoorlie hospital—two of the men were Australian born. The climatic and sanitary conditions in Kalgoorlie are favourable to the spread of the infection.

P. H. M-B.

Davis (C. Noel). **Dysentery in Shanghai. Recent Research.**—*China Med. Jl.* 1923. Feb. Vol. 37. No. 2. pp. 107–115.

——. **Some Recent Observations on the Pathology of the Dysenteries of Shanghai and its Bearing on Treatment.**—*Nat. Med. Jl. China.* 1923. Mar. Vol. 9. No. 1. pp. 27–35.

The material examined between June 30 and October 20, 1922, consisted of 214 specimens of faeces, all of which were investigated microscopically, and 100 by culture also ; much of the material was not satisfactory. *Entamoeba histolytica* was found in 14, and in every case after September 15. Of the 100 specimens cultured, 50 were from typical, fairly fresh, uncontaminated dysentery stools ; the other 50 were not nearly so satisfactory. Dysentery bacilli were isolated from 24 of the first lot, and from 14 of the second. Though the material investigated was not in the best condition, the author considers it safe to say that in Shanghai in 1922 bacillary dysentery was more prevalent than amoebic, particularly before September 15.

P. H. M-B.

Lämpe. **Das weisse Blutbild bei Ruhr.** [The Leucocyte Picture in Dysentery.]—*Med. Klin.* 1923. Apr. 22. Vol. 19. No. 16. pp. 540–541.

The author has investigated the blood picture in 30 dysenterics, both during the acute stage and in convalescence, with an average

of 10 examinations in each case. In the less severe cases there was a slight leucocytosis (8,500–18,000), and the count became normal after the appearance of normal motions ; the eosinophiles were 1–3 per cent., the large mononuclears 2–3 per cent. ; the lymphocytes were raised over the normal, 30–55 per cent. In 12 clinically severe cases it was as follows :—The leucocytes were increased from 7,000 to 22,000, the count becoming normal during convalescence ; the eosinophiles were reduced to 0, but increased even to 12 per cent. during recovery ; the proportion of lymphocytes was not raised during the acute stage, though in convalescence it reached 48 per cent. In the very severe cases (11) there was a most pronounced leucocytosis of 40,000, resolving shortly before death, the eosinophiles disappeared and the lymphocytes showed a relative diminution. In rapidly fatal cases the proportion of lymphocytes sinks very quickly ; it may be as low as 7–15 per cent.

The cases investigated were either Flexner-Y or Shiga infections.

P. H. M-B.

Le Roy des Barres. **Complications chirurgicales des dysentéries.**— *Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. I. pp. 28–85.

Perforation of the colon with consequent peritonitis accounts for 12–15 per cent. of deaths from dysentery, especially amoebic dysentery, and has been recorded also in the balantidial variety. The perforation, which may be single or multiple, usually occurs in the caecum or sigmoid flexure. The peritonitis thus produced may be local or general according as it is shut off by adhesions or not. Generally speaking, there are few, if any, striking symptoms, and in some cases, generally of bacillary origin, no localizing signs of perforation at all with wide-spread infection of the peritoneum. On the whole surgical treatment is unsatisfactory save in those cases in which the peritoneal pus has become localized.

In chronic dysentery surgical intervention is undertaken either to treat the lesions locally or to place the large intestine at rest.

Resection of the colon in an enfeebled patient is not advisable, and the same may be said of entero-anastomosis. Left colotomy cannot be undertaken on account of the lesions being generally situated above this point. Colotomy is by no means so satisfactory as is *caecostomy*, and the formation of an artificial anus in the iliac fossa. The operation of *appendicostomy* has been attended by a considerable degree of success ; it is simple and rapidly performed. There are two forms of caecostomy opening, partial and complete ; the former does not differ materially from appendicostomy. The complete caecostomy permits of the diversion of the intestinal contents and thus keeps the large gut at rest. Usually the operation involves the removal of the appendix.

In the acute stage such major operations should not be attempted. In a sub-acute attack supervening upon the chronic form complete caecostomy should be undertaken and may be regarded almost as an emergency operation. In stenosis of the gut caecostomy is also justifiable, and, in addition, intestinal lavage is indispensable, for which the author recommends silver nitrate 1 : 4,000, or tannin with borate of soda. Before closing the caecostomy opening one should ascertain that the dysentery is completely cured, which is not always easy. Numerous factors must be taken into consideration, such as the

number and appearances of the stools, the results of sigmoidoscopy, etc. It is usually necessary to wait 2–3 months after complete cessation of symptoms. The procedure of closing the wound varies according to circumstances, and attention is drawn to the value of thermo- and electro-cautery.

Typhlitis and perityphlitis are encountered in all forms of dysenteric ulceration and may lead to abscess formation and a similar affection of the appendix may co-exist. In the former case caecostomy is the only safe procedure.

Dysenteric appendicitis is usually amoebic in origin and associated with ulceration in other portions of the bowel, but a special form exists which may appear before the usual dysenteric symptoms. It is extremely difficult to diagnose true dysenteric appendicitis, especially in the acute condition, when the pain is not definitely localized. Dysenteric ulceration in the ascending, transverse and descending colon accompanied by inflammatory pericolitis may simulate and therefore be mistaken for malignant disease of the gut.

In the sigmoid three distinct processes may be distinguished, acute inflammation accompanied by oedema, suppurative perisigmoiditis and plastic sigmoiditis. Rectocolitis of dysenteric origin must be distinguished from arsenic or mercury poisoning and from syphilitic or tubercular ulcerations. The ulcerations in these cases can be treated by the application of silver nitrate through the sigmoidoscope. Other substances, such as dermatol, peroxide of zinc, etc., may be applied locally.

In extreme polypoid formation in the rectum, generally due to intestinal schistosomiasis, excision and curettage of the lesions is necessary, and sometimes extirpation of the whole of the mucosa by means of a Whitehead operation.

The etiology, symptoms, and treatment of liver abscess are discussed *in extenso*, but without novelty.

Amoebic abscess of the lung may originate either by direct extension through the diaphragm or in embolism due to septic absorption ; in the latter case hepatic signs may be absent.

Other metastatic abscesses of possible amoebic origin are mentioned, such as those of the brain and kidneys. The author believes in the existence of a phagedenic condition of the skin, costal caries, ovaritis, salpingitis and mammitis due to *Entamoeba histolytica*.

The dysenteric arthropathies occur in 1–2 per cent. of bacillary cases, but the author does not mention any surgical remedial measures.

P. H. M-B.

Cole (Percival). **A Specimen of Colon, showing Multiple Perforations resulting from Dysentery.**—*Proc. Roy. Soc. Med.* (Section of Surgery). 1923. June. Vol. 16. No. 8. pp. 67–68.

The specimen was removed post-mortem from a female patient, aged 28, who had recently returned from a holiday in Germany, Switzerland and France. Sigmoidoscopy showed soft oedematous and papillomatous masses protruding into the lumen of the bowel. Emetine injections had no effect. The faeces were loose, tinged with blood, and contained shreds of mucus ; microscopically there were epithelial cells, pus cells and many red cells.

The intestines were matted together and when separated numerous perforations, forming a lattice work, became visible. The interior of descending colon and sigmoid was covered by a number of plum-coloured excrescences arising from the mucous membrane. Microscopic examination showed considerable infiltration of the submucosa by mononuclear cells, and oedema. In the vessels and lacunae were seen numerous relatively large amoeboid cells, with well-marked nucleus and nucleolus, having the general appearance of *Entamoeba histolytica*.

[The determination of these cells does not appear to have been made by a protozoologist.]

P. H. M-B.

Morin (Henry G. S.). **Syndromes dysentériques guéris par le seul traitement antihelminthique. Notes de clinique.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 330–336. [1 ref.]

During two years' work in Madagascar the author studied 66 cases of dysentery; the faeces were examined fresh, by the enrichment method of Carles and Barthélemy, and were systematically centrifuged.

The frequent association of dysenteric symptoms with helminthic disease is emphasized; this occurred in 51 cases. The helminths were ascaris, trichocephalus, ancylostoma, *Taenia saginata*, and in six instances *Schistosoma mansoni*. There were five cases of amoebic dysentery, but, as no bacteriological examinations were performed, it is impossible to say what was the proportion of bacillary cases.

The symptoms rapidly cleared up after expulsion of the various helminths by means of appropriate drugs.

P. H. M-B.

Whittingham (Harold E.). **Observations on the Pathogenicity and Treatment of Flagellate Dysentery.**—*Brit. Med. Jl.* 1923. May 12. pp. 799–801. [19 refs.]

In the absence of proof to the contrary, Whittingham regards the intestinal flagellates—*Giardia*, *Trichomonas*, *Chilomastix*, *Tricercomonas*, and *Embadomonas*—as pathogenic. He agrees that the finding of an abnormal organism in the bowel of a neurasthenic subject is no proof; but no one can say that recurrent diarrhoea is a normal condition, nor are the flagellates normal inhabitants of the bowel. Giardia especially is associated with pale and pultaceous stools. Diarrhoea occurring in phlebotomus fever is to be attributed to these organisms, especially when they occur in the mucus. Many of his cases of pure "intestinal flagellosis" exhibited a distinct relative and absolute increase of the large lymphocytes and an eosinophilia of 5–8 per cent., possibly due to intestinal irritation. This irritation in turn may lead to neurasthenia. The symptoms thus produced are extremely serious to aviators.

The treatment adopted was vigorous. The patient was placed in bed on a light diet, and sodium bicarbonate, 15 gr., was given thrice daily, with the idea of clearing away the mucus from the intestinal canal; administration of calomel was followed, after catharsis, by thymol in three 30-gr. doses, succeeded by mag. sulph. in two potions. Immediately after the last a course of 33 gr. of emetine bismuth iodide was spread over a period of twelve days. During the fortnight following

thymol treatment lavage of the colon was performed on alternate mornings with a solution of quinine sulphate in water (10–20 gr. of quinine to the pint). This was found most valuable in clearing away lumps of mucus containing large numbers of trichomonas and chilomastix. Subsequently the faeces were examined daily for at least three weeks, a purge being given at least once a week, and thereafter microscopic examinations were carried out at monthly intervals. In cases of relapse the E.B.I. treatment was repeated, and in a few cases a third course was undertaken. Cases which did not respond were regarded as incurable.

The results of this treatment are regarded as satisfactory; at least 50 per cent. of the giardia infections have cleared up and all the trichomonas cases, with one exception, have recovered.

P. H. M-B.

Mazza (S.) & Merlo (E. N.). [**Efficacité du novarsénobenzol (Narsénol) par la voie buccale dans les flagelloses intestinales.**]—*Prense Med. Argentina.* 1922. Dec. 20. p. 591. [Summarized in *Bull. Inst. Pasteur.* 1923. July 15. Vol. 21. No. 13. pp. 524–525.]

In the treatment of diarrhoea associated either with the common intestinal flagellates alone, or concurrent with entomoeba, and even in the treatment of diarrhoea conjecturally referred to colitis or dyspepsia, the authors' experience is that the most intractable cases are cured by novarsenobenzol in coated capsules of 0·10 gm. 4 times a day.

A. Alcock.

i. Vanzetti (F.). [**Sulla colite cistica dissenterica.**] [Cystic Dysenteric Colitis.]—*Arch. per le sc. med.* 1922. Vol. 45. p. 43. [Summarized in *Med. Sci. Abst. & Rev.* 1923. Apr. Vol. 8. No. 1. p. 72.]

ii. Brau (P.). **Les Dysenteries. Clinique et thérapeutique médicales. Complications Médicales.**—*Trans. 4th Congress of the Far Eastern Assoc. of Trop. Med.* 1921. Vol. 1. pp. 118–149.

i. Cystic proliferation of the glands of both small and large intestine in dysenteric colitis is here described. These cystic dilations do not, as a rule, lead to the formation of malignant new growths.

ii. A brief clinical account, laying stress upon treatment, but containing no new information.

P. H. M-B.

Haudurov (Paul) & Arsimoles. **Syndrome dysénteriforme produit par le bacille typhique guérison par le bactériophage du Dr. Herelle.**—*Progrès Méd.* 1923. Feb. 10. No. 6. pp. 61–62.

Kasai (Keijiro). [**On the Type of Dysentery Bacillus obtained in the Epidemic of Dysentery which broke out in Kyoto in 1921, with Special Reference to the Changes in the Agglutinability, Antigenic Property and Fermentation.**]—*Nihon Biseibutsugakkwai Zasshi* (*Jl. of Japan Microbiol. Soc.*). 1922. Sept. Vol. 16. No. 9. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

Thomson (J. G.) & Robertson (Andrew). *Dientamoeba fragilis* **Jepps and Dobell, 1917. A Case of Human Infection in England.**—*Jl. Trop. Med. & Hyg.* 1923. May 1. Vol. 26. No. 9. pp. 135–136. With 1 plate.

Watanabe (Tai). **Serologische Untersuchungen an Shigabakteriophagen.**—*Ztschr. f. Immunitätsf. u. Experim. Therap.* 1. Teil Orig. 1923. June 22. Vol. 37. No. 1/2. pp. 106–147.

Whittingham (Harold E.). **Observations on the Pathogenicity and Treatment of Flagellate Dysentery.**—*Brit. Med. Jl.* 1923. May 12. pp. 799–801. [See this *Bulletin*, Vol. 20, p. 414.]

SPRUE.

Scott (H. Harold). **A New Theory as to the Causation of Sprue and the Results of Treatment based thereon.**—*Trans. Roy. Soc. Trop. Med. & Hyg.* 1923. Feb. 15. Vol. 16. No. 8. pp. 475–477.

Impressed by the similarity between some of the symptoms of sprue and those of other diseases in which calcium deficiency, or disordered calcium regulation, plays a part, Scott had the opportunity of putting theory into practice in the actual treatment of a case. The work of Vines has shown that calcium is present in the blood in two forms, the combined or " coagulative " and the " ionic," and the metabolism of calcium appears to be controlled by the parathyroids. Treatment by calcium alone led merely to a partial and temporary improvement, but, when combined with parathyroid medication, the results were most striking. The cramps, the soreness of the mouth, the acidity and flatulence rapidly disappeared and the stools for the first time for two years regained their normal colour ; the patient rapidly put on weight and regained his normal health. The theory that Scott propounds is as follows :—

In the endemic areas of the disease the conditions are such that there is an excessive proteid or fatty diet, or the method of cooking the food may lead to an acid dyspepsia. Excess of proteids stimulates an over-production of acid in the gastric juice and may lead to habitual over-acidity. The entrance of acid into the duodenum stimulates the production of secretion, which in turn leads to over-stimulation of the pancreas and secondarily to an upset in the balance of the endocrine glands. Evidence is accumulating that endocrine disturbance and alimentary toxaemia are frequently associated ; also all acute and chronic toxaemias react in some degree upon the parathyroids, causing disturbance of calcium metabolism. The stimulation of pancreatic function is shown by the analyses of sprue stools. Normally, neutral fats present are to fatty acids in the proportion of 1 : 2, but in pancreatic disease this ratio is reversed and may be 15 : 1. In sprue, however, more splitting up of neutral fat takes place, the proportion of neutral to fatty acids being 1 : 3 to 1 : 5.

P. H. Manson-Bahr.

Lambert (S. M.). **A Personal Experience with Sprue.**—*Jl. Amer. Med. Assoc.* 1923. June 30. Vol. 80. No. 26. p. 1910. [1 ref.]

The author contracted sprue in Queensland in 1919 and treated himself with hydrochloric acid and pancreatin, his attention having been drawn to this method by the article by Brown [see this *Bulletin*, Vol. 9, p. 197]. The dosage consisted of 15 minims of 0·2 per cent. hydrochloric acid before and 10 gr. of pancreatin after each meal, no dietary precautions being observed. He so rapidly improved that he was able to remain in the endemic centre without return of symptoms for another year. This treatment is now being generally adopted along the Queensland coast.

P. H. M-B.

Ashford (Bailey K.). **A Clinical Investigation of Tropical Sprue.**—*Amer. Jl. Med. Sci.* 1923. Feb. Vol. 165. No. 2. pp. 157–173. With 6 figs.

The principal factors in the production of the complex symptoms of sprue are glandular insufficiency and colonization in the digestive tube of a superimposed specific organism—*Monilia psilosis*.

The usual sequence of events in sprue as it occurs in Porto Rico is as follows :—

A physiological glandular deficiency due to hereditary depression of cellular vitality, long continued exposure to a tropical climate, lack of healthful exercise, of sufficient sleep and suitable food, an ill-balanced diet composed of inordinate quantities of vitamin-deprived cereals, sweets and fat, previous wasting diseases, such as dysentery, malaria and syphilis. The gradually developed symptom-complex which follows these predisposing causes includes: asthenia, acid dyspepsia, flatulence, constipation, shrinkage of the liver, loss of appetite, disorders ot menstruation, pigmentation of the skin, etc. The gradual or abrupt development of sore tongue and large white frothy motions are associated with an increase of all the symptoms of glandular deficiency. In the "borderland cases" between incomplete and complete sprue a clinical diagnosis without positive laboratory findings is practically impossible.

Although this sequence of events is general, exceptions are by no means rare. In a third of the author's cases food deficiency played no part whatsoever. Twelve per cent. of cases were negative "mycologically" and "serologically"; such were usually old chronic cachectic cases. These are in a state of extensive glandular atrophy as a result of sprue and no surprise need be exhibited at the failure to demonstrate *Monilia psilosis* in them. In some undoubted cases of sprue in a state of quiescence, neither can the serological reaction be substantiated nor can the *Monilia* be isolated. Arguing from the analogy of syphilis and tuberculosis both these classes of cases are quite intelligible and they seem to furnish the "scanty material" on which the author's conclusions as regards the etiology of sprue have been criticized. The fact that only 1·5 per cent. of inhabitants of the endemic zones of sprue harbour *Monilia psilosia* without showing any signs of disease, whilst 87·6 per cent. of the author's sprue cases are heavily infected with it, bears out his contentions that this organism is the cause of the disease.

In 1920 a set of questions was prepared covering all the usual clinical phenomena observed in sprue; the list of symptoms is a long one.

The author's "mycologic" series extends from 1914–17 and consists of 476 cases, of which 246 were clinically sprue. His whole series comprises 1,572 cases. The term incomplete sprue apparently applies to cases without marked digestive disturbances and in a series of 1,309 cases we learn that in 12 per cent. there were no clinical phenomena. These statistics have been tabulated and illustrated by graphs or fans, the points in each fan bearing a number corresponding to symptoms already explained in the text. For their interpretation the reader is referred to the original paper.

In 1916–17 the complement deviation test was applied for diagnosis and 88 of the 225 cases of sprue were thus examined: 20 which had been mycologically negative were shown to be serologically positive. In the mycologic series the four cardinal symptoms were grouped in 211 cases. Cases with typical raw tongue and frothy white diarrhoea

constituted 48 per cent. Cases with typical raw tongue, with or without diarrhoea, 53 per cent. Cases with tongue raw at tip and edges, with or without diarrhoea, 11 per cent. Cases in whom only a sensation of burning was felt, with or without diarrhoea, 22 per cent. Cases with both sore tongue and diarrhoea, 83 per cent. Cases with one or other above symptoms, 13 per cent. Cases with neither one nor the other, 4 per cent. The net result of this investigation is summarized in these figures :—

1. Of the 616 cases of sprue, 453 were examined by laboratory methods and 86 per cent. yielded a positive finding for *Monilia psilosis*.

2. Of the 259 cases of glandular deficiency, 124 were examined by laboratory methods and all were negative for *Monilia psilosis*.

Throughout this paper the *Monilia psilosis* is frankly recognized as the " causal organism."

There are numerous tables in the text which are too complicated to admit of adequate summary and therefore should be consulted in the original.

P. H. M-B.

Schaefer (Hans). **Ein Fall von nichttropischer Sprue.** [A Case of Non-Tropical Sprue.]—*Klin. Woch.* 1923. June 11. Vol. 2. No. 24. pp. 1121–1122. [4 refs.]

The author here describes a case of sprue, or sprue-like disease, in a woman of 21 who had never been out of Germany. The illness began in 1918 with dysentery, followed by dyspeptic symptoms and wasting. The stool soon acquired all the well-known characters of a sprue motion. Anaemia of the aplastic type also gradually developed. With treatment for achylia gastrica and pancreatic disturbance improvement took place, but was followed by a relapse a year afterwards with inflammation of the tongue and aphthae on the mucous membranes. The author considers that there can be little doubt about the diagnosis and quotes the cases recently described by Nolen and Talma (Utrecht) and Van Der Scheer in Holland, also one recorded by Begg in England.

P. H. M-B.

Tidy (H. Letheby). **Blood Picture in Sprue.** [Correspondence.]—*Brit. Med. Jl.* 1923. Apr. 28. p. 743.

Blood changes are not infrequent in sprue and may be indistinguishable from those of pernicious anaemia and yet recovery occur. Not much attention seems to have been paid to the blood changes and achlorhydria in colitis and sprue, though these are obviously important points in treatment.

P. H. M-B.

Ashford (Bailey K.). **Investigaciones clinicas sobre el Espru de los Tropicos.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 1–26. With 6 text figs.

CHOLERA.

i. Pondman (A.). **The Way in which Cholera-Vaccin is prepared at the Pasteur Institution at Weltevreden.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 324–330.

ii. Nijland (A. H.). **Results of the Vaccination against Typhoid Fever and Cholera in the Dutch-Indian Army.**—*Ibid.* pp. 593–604. With 10 text figs.

iii. Snijders (E. P.). **On the Localisation of the Bacilli in Carriers of Typhoid, Paratyphoid, Dysentery and Cholera.**—*Ibid.* pp. 333–340. [2 refs.]

i. Anti-cholera vaccine has been prepared in this institution since 1910. The author draws attention to the years 1918–19, when an extensive cholera epidemic prevailed in Java. "By vaccinating the population systematically with 1·0 cc. of vaccine, repeated after six months, we succeeded in removing the epidemic."

ii. A chart shows that for five years previous to the introduction of anti-enterica vaccines morbidity was 10·1 per 1,000 troops; mortality 1·5 per 1,000. For the five years after the introduction of vaccines the figures are: morbidity 4·7 per 1,000 and mortality 0·5 per 1,000.

For cholera a similar improvement is shown. Anticholera vaccines were first employed in 1911. For nine years previous to that date the cholera morbidity per 1,000 troops was 1·13, the mortality 0·29. For the nine years following 1911 the figures were 0·45 and 0·13.

iii. The author records results of laboratory work from 1914 onwards.

J. H. Tull Walsh.

del Rosario (S. V.) & Rizal (L. Lopez). **Some Epidemiological Features of Cholera in the Philippines.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 406–420.

"The agglutinating property of cholera vibrios may be lost or regained under unknown circumstances in cases and carriers, as well as *in vitro*. The loss of agglutinating property of any strain may be taken as an index of a condition of degeneration. The increased occurrence of non-agglutinating vibrios among cases and carriers, means low case fatality."

"As a part of the preventive campaign against the disease it would be unwise to ignore or disregard the existence of the so-called 'non-agglutinable vibrios,' and failure to isolate, quarantine or disinfect persons or things so infected or liable to such infection would be a distinctly dangerous omission." (Ann. Rep. Philippine Health Service, 1917.)

J. H. T. W.

Tomb (J. W.). **A Note on an Investigation into the Value of Essential Oils in the Prevention and Treatment of Cholera.**—*Indian Med. Gaz.* 1923. June. Vol. 58. No. 6. pp. 257–259.

The author is Chief Sanitary Officer, Asansol Mines Board of Health. Owing to severe annual outbreaks of cholera on the coalfields of Bengal this Board was instituted in May, 1916. The area comprised in the mining settlements is 413 square miles, with a population of 329,353 (1921 census), to which must be added a floating population

not less than 125,000. Outbreaks of diarrhoea and cholera in villages must be treated at once with drugs always ready. A mixture based on the following formula was brought into use :—

Spt. Aether	m/30
Ol. Cloves, Ol. Cajuput, Ol. Juniper	āā m/5
Acid Sulph. Aromat	m/15

Dose.—One drachm in half an ounce of water, every half-hour until vomiting and purging cease. (This generally takes place after five or six doses.)

For Contacts.—One drachm in water, once (or twice) daily for one or two days.

The mixture can easily be made in bulk ; it is cheap and pleasant to take. It " has now been administered to several hundreds of such contacts, and in no instance has any case of cholera developed amongst them, although, as we have seen, the number of cases normally to be expected is not less than 50 per cent. of the number of original cases. . . . One dose ot the mixture daily to those immediately exposed to such infection, would seem to be a certain preventative of the development of the disease." The curative value of the mixture in all stages of the disease, short of collapse, is not to be lost sight of, the death-rate of those treated in the Mining Settlements being 16·6 per cent. up to date. For most of these village cases saline injections were out of the question as being only suited for use by a trained medical staff, which the Board does not possess.

J. H. T. W.

Sanarelli (G.). **De la pathogénie du choléra (septième mémoire). Voies de pénétration et de sortie des vibrions cholériques dans l'organisme animal.**— *Ann. Inst. Pasteur.* 1923. Vol. 37. No. 4. pp. 364–395. [45 refs.]

[For previous memoirs see this *Bulletin*, Vol. 19, pp. 379 and 736.]

The experiments described have led to the following conclusions :—

1. In adult rabbits and guinea-pigs vibrios injected into the peritoneal cavity pass rapidly into the circulation and thence to the walls of the intestines.

2. Excretion of vibrios by the intestines, in rabbits, begins a few minutes after the injection, ceases, as a rule, after the twelfth hour, but sometimes may continue for several days.

3. The gastric contents of rabbits and guinea-pigs are so acid that they kill vibrios in two minutes and germs given by the mouth do not pass into the intestines through the stomach.

4. Cholera vibrios spread on the buccal mucous membrane of adult rabbits can pass through the epithelial covering and reach the intestines either through the lymph or the blood circulation.

5. Having arrived in the intestines (4), the vibrios provoke serious chronic changes.

6. To show this passage through the buccal mucous membrane it is wise to employ old cultures, those rich in spheroidal forms.

8. The naso-pharyngeal mucous membranes of adult rabbits and guinea-pigs are even more permeable to vibrios than that of the mouth.

10. The respiratory mucous membrane is also permeable.

12. In adult rabbits which die slowly of intestinal cachexia caused by vibrios injected into the peritonium, nose or trachea, or administered by the mouth, very few vibrios are ultimately found.

J. H. T. W.

Iacono (Igino). **Su un nuovo metodo per la rapida diagnosi dell' infezione colerica.**—*Riforma Med.* 1923. Feb. 5. Vol. 39. No. 6. pp. 121–123.

This paper is not concerned with clinical diagnosis, but with differentiation of cholera vibrios in the laboratory. The greater part is occupied by an enumeration and review of the various methods of culture, etc., already in use. Dr. Iacono's method is based on the serum absorption method which Castellani advocated for differentiation of typhoid and paratyphoid bacilli. The necessary sera are obtained from rabbits.

[For differentiation of *V. cholerae*, see also this *Bulletin*, Vol. 18, pp. 70–71, " Recent Advances, etc."]

J. H. T. W.

Noury (Osman) & Alalou. **L'action de quelques vibrions cholériques sur les sucres.**—*Bull. sanitaire de Constantinople.* 1923. Jan. Nos. 5 & 6. pp. 45–48.

The authors have examined the reaction of several atypical strains of *V. cholerae* [called paracholera varieties by some bacteriologists] upon various sugars with the results shown in the following table :—

Cholera Vibrios of Russian Origin and Recently Isolated, agglutinating at 1/6,000.

Name of Strain.	Glucose.	Levulose.	Maltose.	Saccharose.	Lactose.	Inulin.	Mannite.
Tchilinguir 6	+	+	+	+	0	0	0
Cavak 6	+	+	+	+	0	0	0
Cavak 20	+	+	+	+	0	0	0
Cavak 22	+	+	+	+	0	0	0
Cavak 25	+	+	+	+	0	0	0

Cholera Vibrios from Various Sources, agglutinating at 1/5,000 or 1/6,000.

Egyptien 38	+	+	+	+	0	0	0
Annamite	+	+	+	+	0	0	0
Schoerter	+	+	+	+	+	0	0
I.P.C.	+	+	+	+	+	0	+

Non-Agglutinating Vibrios from Various Sources.

Massaouah	+	+	+	+	0	0	0
Tor	+	+	+	+	+ (slight)	+ (slight)	+
Deneke	+	+	+	+	0	0	0
V. Metchnikovi ..	0	±	+	+	0	0	0
V. Phosphores ..	0	+	0	0	+	0	0
X.7	+	0	0	0	+	0	0

Most of the strains produce no effect on lactose, inulin and mannite ; but strains which, like " El Tor " produce haemolysis in blood-cultures, seem able to decompose these three sugars. The authors describe their methods, and, wisely, give the commercial, or laboratory, origins of vibrios and of the various sugars.

J. H. T. W.

Shiiba (Yoshiya) & Ushijima (Tomoki). [**On the Nature of Cholera Vibrios, with Special Reference to the 1921 Strains.**]—*Chosen Igakkai Zasshi* (*Jl. Korean Med. Soc.*). 1922. Dec. No. 40. [Summarized in *Japan Med. World*. Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 59.]

Out of 20 strains tested by the authors one, only, failed to give the "Cholera red" reaction. Many showed haemolysis in blood (goat, pig, etc.) agar cultures, but this property varied when the vibrios were first cultivated in peptone water or broth to which goat or horse erythrocytes were added. All the 1921 strains were of slight virulency. The Korean, Moji and Kanagawa strains were typical; the Nagasaki strain atypical.

J. H. T. W.

Manwaring (W. H.), Boyd (W. H.) & Okami (S.). **Study of Bacterial Products by Means of Excised Mammalian Heart. I. Endotheliotoxin of** *S. cholerae.*—*Jl. Infect. Dis.* 1923. Apr. Vol. 32. No. 4. pp. 307–308. With 1 text fig. [2 refs.]

"Filtrates from broth cultures of *S.* [*V.*] *cholerae* are almost non-toxic for the conducting and contractile tissues of the excised rabbit heart. The filtrates, however, are markedly toxic for the capillary endothelium, producing striking myocardial edema and diapedesis."

J. H. T. W.

i. Goodpasture (Ernest W.). **Histopathology of the Intestine in Cholera.**—*Philippine Jl. Sci.* 1923. Apr. Vol. 22. No. 4. pp. 413–424. With 1 plate. [5 refs.]

ii. ——. **A Poisonous Constituent in Cholera Stools.**—*Ibid.* pp. 439–445. [2 refs.]

i. Requires no detailed notice.

ii. The author's experiments show that a substance precipitated by alcohol from the watery stools and intestinal contents from cholera cases is very poisonous to dogs. The experiments are described in detail.

J. H. T. W.

Gildemeister (E.) & Herzberg (Kurt). **Ueber den Wert des Kartoffelstärkepeptonwassers nach Kodama und Takeda für die praktische Cholera-Diagnose.** [Value of Starch Peptone Water in Cholera Vibrio Diagnosis.]—*Cent. f. Bakt.* 1 Abt. Orig. 1923. Mar. 12. Vol. 90. No. 2. pp. 53–55.

Reviewing and repeating the work of the Japanese bacteriologists, Gildemeister and Herzberg conclude that some strains of *V. cholerae* do not produce sufficient diastase ferment to react in a manner reliable for practical diagnosis of the cholera vibrios [v. Kodama & Takeda, this *Bulletin*, Vol. 19, p. 380].

J. H. T. W.

Puntoni (V.). **Sopravvivenza decennale del vibrione colerico conservato in liquido peritoneale.** [Survival of Vibrios for Ten Years in Peritoneal Fluid.]—*Ann. d' Igiene.* 1923. May. Vol. 33. No. 5. pp. 321–324. [1 ref.]

The vibrios were taken from :—(1) a guinea-pig inoculated 1912 ; (2) a guinea-pig inoculated with the same vibrios October, 1912 ; (3) guinea-pigs inoculated with the "El Tor" variety of cholera vibrio, November, 1912 ; (4) guinea-pigs inoculated with a Massaua strain, November, 1912. Cultivated in agar and peptone water 1, 3 and 4 were found sterile ; but from No. 2 about 100 colonies grew on agar. These retained virulence for guinea-pigs.

J. H. T. W.

D'Herelle (F.). **Sur un "Principe bactériolysant," non bactériophage, existant dans l'intestin des cholériques.**—*C.R. Soc. Biol.* 1923. Mar. 24. Vol. 88. No. 11. pp. 723–724.

Describes the experimental finding of a body able to dissolve *V. cholera* :—

"This substance appears in the stools from 3–4 days after the onset of the disease and persists up to the time of death. . . . In a convalescent I was able to follow this substance from the onset up to the sixteenth day."

J. H. T. W.

Kabeshima (Tamezo). [**Choice of Immune Reactions for the Purpose of the Diagnosis of Cholera Vibrios.**]—*Kaigun Gun-i-Kwai Zasshi* (*Proc. Navy Med. Corps.*). 1922. Oct. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

——. [**On the Biological Nature of Cholera Vibrio, which was Isolated from Cases occurring in Fukuoka in 1922.**]—*Ibid.* [Summarized in *Japan Med. World.* Tokyo. 1923. Feb. 15. Vol. 3. No. 2. p. 37.]

Maymone (Bartolo). [**Le attività biochimiche del vibrione colerigeno.**]—96 pp. Salerne : Impr. Jovane. [Summarized in *Bull. Inst. Pasteur.* 1923. May 31. Vol. 21. No. 10. pp. 379–380.]

PLAGUE.

i. Van Steenis (P. B.). **The Way in which Plague spreads over Java.** —*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 1. pp. 566–583. With 2 folding maps. [5 refs.]

ii. Otten (L.). **Lecture on Plague.**—*Ibid.* pp. 617–628. With 3 plates & 1 chart.

i. The following four means by which infection spreads are given by the author :—(1) plague bacillus in ground dust, food or on articles for daily use ; (2) man suffering from plague ; (3) rat suffering from plague ; (4) flea carrying the bacillus. Map I shows how infection may travel along railways or tramways ; Map II shows the dates of local infection (1919) and the number of plague cases.

ii. A general account of plague, with special reference to outbreaks in Java. The plates show sanitary staff disinfecting a village, with evacuation during disinfection.

J. H. Tull Walsh.

Van Steenis (P. B.). **Epidemiologische studie van de pestepidemie te Solo (Soerakarta) Maart 1915–April 1916.** [Epidemiologic Study of the Plague Epidemic at Solo-Soerakarta (Java), March 1915–April 1916.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 2. pp. 285–302. With 4 maps. [3 refs.]

Though he cannot give the actual proof of his views, the author makes it probable that in this epidemic the local spreadings were caused by an epizootic of *M. rattus*, whilst the metastatic spreading over longer distances was brought on by an epizootic of *M. decumanus*, living along the river sides and in the town drains. Often public markets where *rattus* and *decumanus* meet were the centres of new extensions.

W. J. Bais.

Salm (A. J.). **De pestepidemie in Blitar in 1921–22.** [The Plague Epidemic at Blitar (Java), 1921–22.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 73–88. With 1 map & 1 chart in text.

A clear account of this epidemic. After some minor outbreaks in 1911, 1913, 1915, 1916 and 1917, 60 cases, with 58 deaths, occurred from October, 1921–January, 1922. Other cases probably occurred before the disease was recognized. There were four cases of pneumonic plague (one secondary).

W. J. Bais.

Mora (A. Damas) & others. **A pandemia de peste durante o ano de 1921. As epidemias de Angola em 1921–1922.** [Pandemic Plague in 1921. Plague in Angola (1921–22).]—*Rev. Méd. Angola.* 1922. Sept. No. 3. pp. 7–132. With 1 map.

This is a sequel to the report on plague in Loanda already reviewed [this *Bulletin*, Vol. 19, p. 368].

A table is given showing the prevalence of plague in various countries in 1921. Next follow descriptions of the outbreak in different districts of Angola in 1921–22, namely Catete (May, 1921–March, 1922), Melanje (November, 1921–May, 1922), Novo Redondo (November, 1921) where there had been a high rat mortality in the preceding August, Mossamedes (February–April, 1922); here there were 116 cases, with 82 deaths (70·69 per cent.), and more than half were between the ages of 11 and 25 years. In Benguela there were 44 cases, of whom 26 died. Loanda was the seat of a second epidemic in September–November, 1922; there were 90 cases, with 42 deaths, and all were bubonic. Those with axillary buboes ran a more severe course and accounted for most of the fatalities [v. this *Bulletin*, Vol. 19, pp. 543–544].

Preventive measures consisted in disinfection of dwellings with sulphur, mainly by Clayton's apparatus, and the administration of anti-plague vaccine. At first a dose of 0·5 cc. was given, but better results appear to have been obtained with a larger initial dose, 1 cc., which produced a marked reaction "simulating an attack of plague." In severe cases serum was injected in doses of 40–60 cc. intravenously.

Anti-plague vaccine from the Paris Pasteur Institute was used for treatment.

H. Harold Scott.

i. Leger (Marcel) & Baury (A.). **De la peste chez les Muridés et les Musaraignes à Dakar.**—*Bull. Soc. Path. Exot.* 1923. Feb. 14. Vol. 16. No. 2. pp. 133–137. [3 refs.]

ii. —— & ——. **De l'emploi de la Chauve-Souris comme animal réactif dans la peste.**—*Ibid.* pp. 78–79. [9 refs.]

i. A detailed account with tables of examination of rodents and shrews [see this *Bulletin*, Vol. 19, p. 367 (Leger & Baury)].

ii. The authors record that the bat, *Nyctinomus pumilus*, is very sensitive to Yersin's bacillus. Intraperitoneal inoculation of *B. pestis* is followed by death in 28 hours, intranasal in 36, and intramuscular in 30 hours. Bacilli are found in all organs. [Bats do not, so far as we know, die naturally of plague.]

J. H. T. W.

Mathis (C.). **La Musaraigne, réservoir de virus pesteux au Cambodge.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 158–159. [1 ref.]

Confirms Kerandel's statement that *Crocidura murina*, when dwelling among rats suffering from plague, can be infected by fleas which quit dead rats for living shrews. In one dead shrew examined by the author *B. pestis* was found in the spleen. Among 24,460 animals captured during sanitary destruction of rats, in Cambodia, Dr. Menant counted 2,508 shrews [*cf.* Leger & Baury, this *Bulletin*, Vol. 19, p. 367].

J. H. T. W.

Chamberlain (E. Noble). **A Small Epidemic of Plague.**—*Brit. Med. Jl.* 1923. May 26. pp. 896–897.

Describes an outbreak of plague on a ship sailing from Karachi to Liverpool. There were six cases, all fatal, among the lascar crew;

no Europeans were affected. Case six was one of virulent pneumonic plague; the other five showed inguinal buboes. Anti-plague serum was not available until the ship reached Dunkirk. Case No. 5 occurred at this time and the man (with temp. 104° F. and delirious) received 50 cc. daily from March 24 to March 31, when he died. The crew received each 10 cc. of the serum as a prophylactic, and subsequently 1 cc. of anti-plague vaccine. After vaccination no further cases occurred. The cases occurring before Dunkirk was reached were treated with Tr. Iod., and the tincture was also injected into the buboes. [See this *Bulletin*, Vol. 20, p. 362 (JOLTRAIN and DE GENNES).]

J. H. T. W.

TANON (L.) & CAMBESSÉDÈS. **Les formes liminaires de la peste et la question du bubon climatique.**—*Rev. Méd. et Hyg. Trop.* 1923. May–June. Vol. 15. No. 3. pp. 65–74. [Refs. in text.]

The term "climatic bubo" is most unfortunate for, setting aside buboes due to venereal infection and due to streptococci gaining entrance through wounds in the leg, most of these belong to mild cases of plague. The authors regard RAVAUT's opinion as to such buboes being lymphogranulomata as "too absolute." [v. RAVAUT, this *Bulletin*, Vol. 18, p. 297].

"To admit that every bubo called climatic, of slow progress, healing always with or without suppuration and without general reaction is a lymphogranuloma and not due to plague, lays one open to mistakes, since we run the risk of overlooking latent and dangerous cases not suspected.

"Climatic bubo does not represent a well determined malady but a symptom of slow gland infection, nearly always in the groin and due to various pathogenic causes.

"For our part we observed during the course of the small outbreak in Paris during 1920 [v. this *Bulletin*, Vol. 20, p. 362 (JOLTRAIN)] numerous cases of sub-acute adenitis in which plague infection could be demonstrated and which gave the clinical picture of 'climatic' bubo."

M. GRAVELLAT (discussion) drew attention to the necessity for seeking out the plague bacillus in all cases of adenitis among the indigenous troops, even when the cases appeared trivial. It is useful to warn medical officers of the possibility of plague buboes being benign in so far that bacilli may be absent.

J. H. T. W.

TSURUMI (Sanzo), HARA (Chikawo), SAKAMOTO (Tokuichiro), IMAI (Minoru) & AOKI (Tsutomu). [**Studies on Pulmonary Plague.**]—*Nisshin Igaku* (*Progress in Med.*). 1922. Nov. Vol. 12. No. 3. [Summarized in *Japan Med. World.* Tokyo. 1923. Mar. 15. Vol. 3. No. 3. p. 61.]

1. The distribution of the bacilli in the cadaver was so restricted in two out of 13 cases that all viscera and the heart blood were free from *B. pestis*. In these two cases bacilli were found only in the lungs.

2. From the point of view of pathology and histology pneumonic plague may be divided into two forms:—(1) haemorrhagic serous

pneumonia, and (2) cellular effusive pneumonia; with intermediate forms. (1) is lobular and the foci are united, so that the entire feature appears as diffuse red 'hepatic' degeneration, while (2) is chiefly lobar greyish-white degeneration.

3. By injecting bacilli directly into the air passages, or into the lung tissues, plague pneumonia could be experimentally produced in guinea-pigs and rabbits [*cf.* this *Bulletin*, Vol. 19, pp. 372–373 (Wu Lien Teh)].

J. H. T. W.

Lhuerre (H.) & Leger (M.). **Sur un cas de peste pulmonaire à évolution atypique.**—*Bull. Soc. Path. Exot.* 1923. Mar. 14. Vol. 16. No. 3. pp. 203–207. [3 refs.]

The authors draw a wise line between pneumonia and broncho-pneumonia arising as secondary complications in cases evidently bubonic in origin. The interesting case which they give with full details may be thus abridged :—

Sikhon Kamera, admitted to hospital January 9, 1923, with "suspected broncho-pneumonia"; fine crepitant râles all over the lungs; temp. 37·5° C.; resp. 34; sputum blood stained. No enlargement of glands. Examination of sputum showed cocco-bacilli resembling *B. pestis*. No tubercle bacilli found. For ten days the condition remained unchanged, and then the patient appeared worse, with drawn features, intense dyspnoea and temp. 38·9° C.; pulse irregular and soft. Sputum markedly bloody; râles increased. *B. pestis* was found not only in the sputum, but also in fluid taken from an apparently normal gland in the groin. Anti-plague serum was injected, 100 cc. (intravenous), on January 25, and again on January 26 [such small doses are not of much value, and so far as the record goes no more was given]. The patient died on February 11. The diagnosis of plague was confirmed by experiments on mice and on a grey rat.

Dr. Acar stated that such sub-acute cases of pneumonic plague were more common than is generally supposed. He had cured similar cases with anti-plague serum. Such anti-plague treatment is urgent and should be given as soon as a suspicious cocco-bacillus is seen in the sputum. It is not wise to wait for further confirmation; the remedy may arrive too late, as in the case reported.

J. H. T. W.

Nogue (M.). **Un cas de méningite pesteuse.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 378–381. [4 refs.]

A Senegalese gunner, aged 40, was admitted into the Colonial Hospital, Dakar, on February 1, suffering from pneumonia. On the 24th there was a rapid rise of temperature to 39° C., with pain in the lumbar region and incessant groaning. A lumbar puncture showed cocco-bacilli resembling plague germs. Similar bacilli were obtained from an apparently normal inguinal gland. On February 26 anti-plague serum, 100 cc., intravenous; repeated on the 27th. The man died that night. After autopsy plague bacilli were found in the pneumonic lungs and in the bronchial lymphatic glands. The cranium was not opened.

J. H. T. W.

Teissier (P.), Gastinel (P.) & Reilly (J.). **De quelques documents anatomiques concernant la peste bubonique (Epidémie Parisienne. Exposé des faits (Premier mémoire).**—*Jl. de Physiol. et de Path. Génér.* 1923. Vol. 21. No. 1. pp. 104–116. [2 refs.]

——, —— & ——. **Principaux caractères anatomiques de la peste bubonique—considérations générales. (Deuxième mémoire.)**—*Ibid.* pp. 123–131. With 10 figs. [2 refs.]

These papers contain a careful study of the conditions found in fatal cases. As the gross and microscopic anatomy is recorded in textbooks, detailed notice is not necessary.

[For reference to the Paris epidemic, see this *Bulletin*, Vol. 20, p. 362 (Joltrain).]

J. H. T. W.

Fusco (G.) & Patane (C.). **Ancora sulla fine struttura del bacillo della peste.**—*Pathologica.* 1923. Apr. 15. Vol. 15. No. 346. p. 253. [4 refs.].

The authors point out that there have been described certain granules seen in the body of *B. pestis* when stained with ammoniacal solution of methylene blue.

Their observations show that these granules can be generally demonstrated in bacilli from cultures or sometimes in those taken direct from a plague bubo. They are easily found in bacilli grown on ox serum solidified with 15 per cent. glucose. Similar granular structures can be seen in certain allied germs, such as the pseudo-tuberculosis bacillus of rodents, if grown and stained by the methods described.

[*Cf.* this *Bulletin*, Vol. 17, McCoy, p. 388 ; Smillie, p. 398 ; Vol. 18, Epstein, p. 376 ; and Piccinini, p. 730.]

J. H. T. W.

i. Lavandero (R.). **Observaciones clinicas y tratamiento de la Peste Bubónica durante la epidemia del 1921.** [Clinical Signs and Treatment of Bubonic Plague.]—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 40–49. With 1 fig.

ii. Giuliani (S.). **Examen de los esputos practicados en el Laboratorio Biológico durante la epidemia de Peste Bubónica en Puerto Rico, 1921.** [Examination of Sputum in the Laboratory during an Epidemic of Bubonic Plague.]—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 61–63.

iii. Leger (Marcel) & Baury (A.). **Souche pesteuse isolée des porteurs sains humains et sa virulence comparée.**—*Bull. Soc. Path. Exot.* 1923. Jan. 10. Vol. 16. No. 1. pp. 54–57. [5 refs.]

iv. Wickersheimer (Ernest). **Les recettes de Philippe Melanchthon contre la peste.**—*Janus.* 1923. Jan.–Feb. Vol. 27. No. 1. pp. 1–7. [26 refs.].

v. Acar (M.). **Evolution de la peste au Sénégal.**—*Bull. Soc. Path. Exot.* 1923. May 9. Vol. 16. No. 5. pp. 372–373.

i. The author describes, in detail, the clinical symptoms observed during the epidemic. He found anti-plague serum of great value and rightly insists on large doses given early :—250 to 500 cc. during the day.

ii. Describes the methods and stains used during routine examinations of sputum for detection of *B. pestis*, tubercle bacilli, etc., and to distinguish between Gram-positive and Gram-negative germs.

iii. A study of the comparative virulence for rodents of strains of plague bacilli isolated from healthy carriers.

iv. Of historical interest, especially to botanists.

v. See this *Bulletin*, Vol. 17, p. 390 (Esquier); p. 391 (Ambrose).

J. H. T. W.

Chawla (Gopal Singh). **A Case of Oedema of the Leg following Plague.**—*Indian Med. Gaz.* 1923. Mar. Vol. 58. No. 3. p. 120.

Nikanoroff (S.). **Les épidémies de peste au sud-est de Russie en 1922-1923.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. [In Russian, pp. 38–41. Abridged Version in French, pp. 91–92.]

Ortiz (Pedro N.). **Puntos fundamentales en el diagnóstico de la Peste Bubónica.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 56–61. With 1 fig.

Otero (P. Morales). **Estudio epizotico de la epidemia de Peste Bubónica en Puerto Rico, 1921.**—*Bull. Porto Rico Med. Assoc.* 1923. Mar. Vol. 17. No. 141. pp. 49–56. With 2 figs.

Souvoroff (S.). **L'épidémie de peste dans la commune Fédocéevka de l'arrondissement de Kalmouk.**—*Rev. Microbiol. et Epidemiol.* Saratov. 1923. Vol. 2. No. 1–2. [In Russian, pp. 70–73. Abridged Version in French, p. 96.]

Wu Lien Teh, Chun (J. W. H.) & Pollitzer (R.) **Clinical Observations upon the Manchurian Plague Epidemic, 1920-21.**—*Jl. of Hyg.* 1923. May. Vol. 21. No. 3. pp. 289–306. With 2 charts in text. [Refs. in footnotes.]

Zabolotny (D.) **Études épidemiologiques. I. L'origine de la peste endémique.**—*Ann. Inst. Pasteur.* 1923. June. Vol. 37. No. 6. pp. 618–626. With 4 plates. [10 refs.]

ENTERIC FEVERS IN THE TROPICS.

Pirie (J. H. Harvey) & Orenstein (A. J.). **Notes on the Administration of Vaccine per os in an Outbreak of Enteric Fever.**—*Med. Jl. S. Africa.* 1923. Apr. Vol. 18. No. 9. pp. 224–228. With 1 chart. [5 refs.]

Influenced by the arguments of certain recent authorities who regard immunity as fundamentally a tissue-immunity acquired by the cells of the particular tissues susceptible to the particular bacillus, and encouraged by the experience of Vaillant, who in an epidemic of typhoid in France successfully vaccinated over 1,000 people directly by the mouth with anti-typhoid bile vaccine, the authors, in an epidemic of typhoid at Witwatersrand, tried conclusions with Besredka's method of vaccination *per os*.

The epidemic began in November, 1922, in a native mine population of 3,605. Vaccination was not started until the 4th January and was completed on the 12th, about 3,500 being vaccinated and about 100 not. Between the 4th January and the 24th February (since when no more cases have appeared for treatment) 20 cases were admitted, of which 16 had been vaccinated and four not. Of the 16 vaccinated five died, and of the four not vaccinated three died. The 16 vaccinated, however, must have been far gone in the disease when admitted, since their deaths occurred on the 2nd, 4th, 6th, 12th, and 18th days after admission, so that probably they were already in the incubation stage when they were vaccinated. The authors admit the possibility of the epidemic being on the decline when vaccination was commenced, but think that the facts as stated tell in favour of oral anti-typhoid vaccination.

The method of vaccination was as follows: *B. typhosus* (seven strains were used) was grown in trypsinated ox-heart broth for a term of about eight hours and then killed with phenol (one per cent.). The bacilli were removed in a paste by centrifuge, and the paste was diluted with normal saline containing 0·5 per cent. phenol so that a teaspoonful dose should contain the equivalent of 0·015 gm. of dried bacilli—approximately forty thousand million. This dose was given, along with a 3-grain keratin-coated ox-bile pill (B.P.), on three successive days to each man, in about 2,000 cases, and on two successive days in about 1,500 cases.

The advantages of giving anti-typhoid vaccine to natives *per os* are that natives do not object to medicine but very much dislike subcutaneous inoculation, and (in this instance) that not a single case of malaise occurred.

The total number of cases admitted during the outbreak was 53, with 17 deaths. Typical typhoid lesions were found *post mortem* in all the 17 fatal cases, in nine of which a Widal test had been performed with six negative and three positive results.

A. Alcock.

Dubinsky (I. A.). **Typhusvaccination per os.** [Anti-Typhoid Vaccination by the Mouth.]—*Geneesk. Tijdschr. v. Nederl.-Indië.* 1923. Vol. 63. No. 1. pp. 68–72. [9 refs.]

The author considers that this method is simpler than the usual method by injection. He gives certain figures in support of his belief and quotes Besredka, whose sensitized vaccine was administered.

[It is true that in experiments on animals BESREDKA and BASSECHES thought that some immunity can be established by feeding with living germs, a method not applicable to human beings: v. this *Bulletin*, Vol. 12, pp. 400–401.] Other and later papers by BESREDKA and others on buccal vaccination are given in the bibliography at the end of the article.

J. H. Tull Walsh.

SNIJDERS (E. P.). **Bijdragen tot de kennis van het typhoied-paratyphoied-vraagstuk in de tropen.** [Contributions to the Study of Typhoid and Paratyphoid in the Tropics]. Graduation thesis.—pp. x + 224. With 11 graphs & 25 charts. 1922. Amsterdam: J. H. de Bussy.

An historical survey of the evolution of our knowledge of the prevalence of typhoid and paratyphoid fevers in the tropics, especially in Netherlands India, and in connexion with the writer's personal experiences as bacteriologist to the pathological institute of Medan (Sumatra).

Contrary to European experience in peace-time, paratyphoid A is likewise prevalent, whereas paratyphoid B is of comparatively rare occurrence; very scarce is that form of paratyphoid B assuming more or less completely the character of typhoid (and not of an acute gastro-enteritis).

The group of paratyphoid B bacilli requires further study. It contains many heterogeneous elements: only the genuine *B. paratyphosus B, B. suipestifer* and *B. enteritidis* (of GÄRTNER) seem to be well defined. All the other members of this chaotic group are very prevalent in human faeces, surface waters, etc., more so than in Europe. Incidentally they might cause diseases resembling typhoid fever, but well-founded observations supporting this view are rare, and they cannot be of use in explaining the etiology of the majority of unclassed fevers.

N. H. Swellengrebel.

SNIJDERS (E. P.). **Typhoid and Paratyphoid Fevers in the Tropics.**—*Trans. 4th Congress Far Eastern Assoc. Trop. Med.* 1921. Vol. 2. pp. 308–333. With 9 charts. [14 refs.]

Historical and statistical, to clarify the view that enteric fever is highly endemic in the tropics. In Sumatra among Javanese and Chinese coolies in seven years the author has met with 1,480 cases of typhoid, 195 cases of paratyphoid A, and 22 cases of paratyphoid B; the death rate was high in comparison with European figures. The author points out that paratyphoid B bacilli are a group with many slightly differing strains or varieties; he has found these in the intestines of a rat and of pigs and even in fish; the strain of the pig was culturally typical, and that of the eel quite typical in all respects.

J. H. T. W.

KHAN (Gopi Pada). **The Use of a Non-Motile Strain of *B. typhosus* in the Agglutination Reaction.**—*Indian Med. Gaz.* Jan. 1923. Vol. 58. No. 1. pp. 18–20.

MISCELLANEOUS.

GAUTIER. **Considérations générales sur la morbidité et la mortalité des Européens et des indigènes au Dahomey, pendant l'année 1921 (Extrait du rapport annuel).**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.–Oct.–Nov.–Dec. Vol. 20. No. 3. pp. 347–360.

Malaria in Europeans in Dahomey is on the whole mild ; pernicious forms are seldom seen ; but the anaemia which follows repeated attacks is established more quickly than in other parts of the coast. Blackwater fever is becoming rarer : it is treated with subcutaneous injections of artificial serum (GOUZIEN).* In natives smallpox is one of the most important factors of mortality. Vaccine is prepared at Kandy for North Dahomey, at Abomey for Middle Dahomey and at Porto Novo for Lower Dahomey ; 91,000 vaccinations were done in the year and 35,000 doses of vaccine were sent to Cameroon. No case of yellow fever has been known since 1917, and sleeping sickness is unknown, unless it occurs in Atacora in the north. Dysentery on the coast, and even in middle Dahomey, has increased in frequency of recent years ; and hepatic complications are less rare. There is said to be little bacillary dysentery. The legend that persons bitten by rabid dogs do not contract rabies has lately been refuted by a case in a native girl at Cotonou. Leprosy is not infrequent ; in the Mono district there are 250 cases among 80,000 natives. The natives isolate the leprous in huts in the middle of their fields. The number of cases of tuberculosis—lung, glands and bones—is increasing. Gonorrhoea is common, and syphilis, rare till recently, is spreading with the return of native troops from France or the East. Pneumonia, as elsewhere in African natives, is common. Ascariasis and ankylostomiasis are common enough, and bilharzia eggs have been detected twice in bloody stools. Guinea-worm and filariasis (Bancrofti) are often met with ; *Filaria loa* was extracted from eyes twice. Alcoholism spreads more and more widely : in 1920, 1,210,000 gals. of spirit were imported. In Lower Dahomey, where the bulk of this goes, it is not unusual to see delirium tremens.

A. G. B.

HUOT. **Valeur physique du recrutement indigène dans les colonies du Gabon, du Moyen-Congo, de l'Oubangui-Chari et dans les territoires du Tchad.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. Sept.–Oct.–Nov.–Dec. Vol. 20. No. 3. pp. 361–385.

This paper is an account of the relative value for military purposes of natives drawn from many tribes over a wide expanse of tropical Africa. While much is of topical value, it contains points of general interest. The recruits from each tribe are classed as good, passable and bad. Thus, in the Gabon Colony the Pahouins are far in front of the other

* GOUZIEN gives hypodermic injections of 200–400 cc. of salt solution, 7–10 per 1,000, once or twice in 24 hours, varying the place and never injecting more than 300 cc. at the same point. Concurrently similar enemata are given. Of 53 cases thus treated at Dahomey all recovered.

tribes. Their average height is 1·68 metres, weight 66 kilos and thoracic measurement 0·87 metres, giving an index of 15 by the Pignet formula.* They are active in commerce and in cultivation of the soil, are well nourished and disease among them is rare. In other tribes of the same average height in the same area the weight is 57 kilos, the chest measurement 0·79 metres, and the Pignet formula 26. Their morbidity was high after incorporation, and due chiefly to pulmonary and intestinal infections. The author insists on the distinction between physical deficiency, which yields to good feeding and healthy surroundings, and organic degeneration, which is irremediable. These tribes, even after a longish period, were losing flesh and were clearly quite unsuitable recruits.

In the Middle Congo Colony nine tribes are listed as forming good recruits. Some had a Pignet index of 24 and 25 and formed excellent material; others had an index of 32 and are classed as bad recruits, but it is noted that their morbidity is not high and that they responded well to a liberal diet. The general conclusion for this region is that the races of the north, used to a drier climate, furnished better recruits than those of the south, a forested region where damp heat prevails and poverty is greater. Whereas the races of the north improved under the conditions of military service, those of the south did not.

Two tribes in the Oubangui-Shari Colony are described as poor material; each came originally from a region to the north; their inferiority is ascribed in part to defective diet and habitat due to their labours in the collection of rubber, which oblige them to abandon prosperous villages and live in damp unhealthy valleys. Trypanosome infection is common. Change of climate was not well stood, and led to increased morbidity.

In the Chad Territory many tribes formed good material, but the difficulties are illustrated by the Saras, whose diet has a honey basis, the Toubbous, who will not submit to any discipline, and the Yedenas, cattle-breeding paddlers who inhabit the banks and islands of Lake Chad and, though robust, are developed in the arms at the expense of the legs, and are used to an almost exclusive milk diet. The Chad races are better developed physically than any of the others of the Colonies named, and become better acclimatized in West Africa, Morocco or even France. In the case of all the tribes, even when transferred from the poorest conditions of food and hygiene to a much more favourable régime they lose weight for 2–3 months. Hence the initial training should be carried out as near as possible to the country of origin.

A. G. B.

OUZILLEAU. **L'Afrique équatoriale française.**—*Presse Med.* 1922. Aug. 9. Vol. 30. No. 63. pp. 1313–1322. With 9 text figs.

We have here a graphical sketch of French Equatorial Africa, a country about five times as big as France, stretching from the eternal desert of the Sahara to the eternal jungle-gloom of the equator. The author divides it, like ancient Gaul, *in tres partes*. First, the Saharan wastes, sparsely peopled by bandit Touaregs, who freeze in winter and gasp at 48° C. in summer; next, the tropical region, of which the

*The Pignet formula = H − (C + W), where H is the height in centimetres, C the chest measurement in centimetres at the greatest expanse, and W the weight in kilos.

northern part consists largely of vast undulating savannah peopled by Arabs and their flocks and herds, and the southern part is, at least in the long rainy season, a balmy land of verdure; and last, the true equatorial region of monotonous tepid moisture and overwhelming suffocating forest.

The author appeals to medical men, of whom, at present, there are only about 35 in the whole vast tract—35, and 2 specialists at the Branch Institute at Brazzaville. The author draws a fine picture of the tropical doctor and his opportunities; he must not only love adventure, he must love his work; he must be a devoted, self-sacrificing person, indifferent to applause; in his unbounded opportunities for studying nature in all her aspects both benign and morbid he will find his reward.

A. Alcock.

Shattuck (George Cheever). **A Preliminary Survey of Tropical Diseases in Massachusetts.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 497–517. With 7 text figs.

The data were obtained from the Massachusetts State Department of Health records for four years for such diseases as are reportable, supplemented by hospital data for the same period, duplication being eliminated by comparing the names of the patients. The following diseases were recorded :—

Name of Disease.	No. of Cases.	Name of Disease.	No. of Cases.
Malaria (reportable) ..	414	Leprosy (reportable) ..	12
Dysentery (reportable) ..	228	Echinococcus cyst	11
Smallpox (reportable) ..	137	Typhus fever (reportable)	7
Heat-stroke	122	*Bothriocephalus latus* ..	5
Pellagra (reportable) ..	75	Beriberi	5
Uncinariasis (reportable) ..	33	Bilharziasis	5
Elephantiasis	27	Aleppo boil	3
Actinomycosis (reportable)	12	Blastomycosis	2

Eight other diseases or parasites were recorded once. In most of the malaria cases there was no blood examination; of the 92 cases in which parasites were found in 78 the infection was benign tertian. Analysis of the place of birth and residence at time of infection makes it probable that 21 cases were contracted near Boston. Of the dysentery cases laboratory confirmation is wanting except in 23 instances in which amoebae were found. The state records show that dysentery is most common in the first decade. Of the 27 cases of elephantiasis one was doubtfully filarial, but the author mentions a case of nocturnal microfilariae in a woman who had never left Boston. The majority of the hookworm cases occurred among the personnel of the Navy and a few from the immigration station. The author says that amoebic dysentery and pellagra are decidedly more common than the numbers indicate, and that all the figures of his list should be regarded as minimal.

A. G. B.

Hegner (Robert W.). **Porto Rico as a Field for the Study and Investigation of Tropical Hygiene.**—*Amer. Jl. Trop. Med.* Baltimore. 1922. Nov. Vol. 2. No. 6. pp. 519–529.

The author made a four months' survey of Porto Rico to determine its suitability as a field for the study of tropical hygiene. Owing to

overpopulation (350 persons per sq. mile), ignorance, and low wages, the food is deficient both in quality and quantity, and ill-health general. Soil pollution is prevalent everywhere. The diseases of the island are malaria and blackwater fever, hookworm (80 per cent. infestation with high worm count), and other parasitic worms, filariasis, yaws, leprosy, dysentery, bubonic plague, beriberi, pellagra, sprue, dengue, besides mycoses. The infantile mortality is 44·7 per cent. of the total mortality; the chief causes are listed as congenital debility, rickets, tetanus and enteritis. The facilities for study are discussed; they seem to be numerous and good. [One would not expect to find rickets cited as a cause of infantile mortality in a tropical island.]

A. G. B.

Corvetto (Aníbal). **De algunas enfermedades parasitarias de los Pulmones en el Perú.** [Some Parasitic Diseases of the Lungs in Peru.]—*An. Facul. de Med.* Lima. 1922. Sept.–Oct. Vol. 5. No. 3. pp. 196–204.

The author mentions hydatid of lung, of which he had previously reported 12 cases, and speaks of "hydatid phthisis," a septic condition following rupture of pulmonary hydatid. Paragonimus infection, he states, is more common than is generally believed, and is usually diagnosed as tuberculosis. Lastly, bronchial spirochaetosis receives brief mention, stress being laid upon a form of this accompanied by haemoptysis, and consequently often regarded as tuberculous. It is said to be very infectious.

H. Harold Scott.

Tainan. **Medical Report of the Tainan Hospital, English Presbyterian Mission, Formosa, 1920–22.** [Maxwell (James L.).]—pp. 1–26. [For distribution among the Medical Profession only.]

Dr. Maxwell publishes this Report because he believes that the arduous nature of the medical missionary's work is not generally realized—he himself has but one colleague and two voluntary nurses—and because little attention has been paid to the comparative pathology of races. He suggests that the bovine origin of certain forms of tuberculosis would be less discussed if it were realized that all forms are common amongst the Chinese, whose diet precludes possibility of bovine infection.

On the medical side the chief diseases are malaria, dysentery, tuberculosis and ankylostomiasis. Over 2,000 stools are examined yearly and 40 per cent. contain ankylostome eggs. Treatment with carbon tetrachloride is on trial. Syphilis and leprosy are very common. Sodium gynocardate and the ethyl esters of chaulmoogra oil are having a prolonged trial in 120 patients; about 25 per cent. have apparently been cured. Tartarated antimony has failed in lung distomiasis, but has been a real help in granuloma pudendi. Cancrum oris, which is not rare in children after measles, yields to salvarsan products, so that 75 per cent. can be saved. Massive splenomegaly, with cirrhosis of the liver and terminal ascites, is a very common disease in Formosa; its origin is uncertain. In suitable cases, without much ascites, splenectomy has proved a complete cure. Earlier diagnosis is required.

Some details are given of abdominal surgery. In the last year 125 such operations were done. Appendicitis is rare. Of six cases in natives,

in some the appendix was probably not primarily affected. The author suspects that the difference in diet between China and the West accounts for the rarity, but notes that appendicitis is becoming more common. Cancer of the stomach is rarely seen, though gastric and duodenal ulcers are not specially rare. Chronic intussusception comes first as an abdominal emergency! Diagnosis from tuberculous peritonitis is difficult. Treatment by ileo-colic anastomosis is satisfactory in all but advanced cases.

Urogenital surgery is common. Rectal stricture, due either to syphilis or gonorrhoea, is relatively frequent and often extreme.

After details of gynaecological and obstetric work come some statistics and a list of operations. The beds number 150. In the 2 years and 10 months the in-patients exceeded 6,000, the out-patients 25,000. There were over 2,000 operations under general anaesthesia. These included :—

Entropion	672	Liver abscess	11
Pterygium	70	Fistula-in-ano	94
Iridectomy..	148	Piles	143
Cataract	94	Tuberculous hip	24
Enucleation	41	Cancer of breast	12
Tuberculous cervical glands	37	Intussusception	18
Inguinal hernia	37	Suprapubic cystotomy ..	34

[Similar reports from other missionary hospitals would be welcome, and perhaps in his next report Dr. Maxwell will give figures from the medical side.]

A. G. B.

Marque, Raynaud & Sallet. **Le massif de Bà-Na, station d'altitude pour le Centre-Annam.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 225–228.

Bà-Na, the sanatorium of Central Annam, is situated at an altitude of 1,400 metres (4,590 ft.), some 30 kilometres from the coast town of Tourane, from which it is accessible in part by motor road. The average maximum temperature during the authors' stay was 24·1° C., the average minimum 16·5° ; it is colder than the plains by 10 or 12° C. Fifty-four Europeans who stayed there during the summer of 1920 derived much benefit.

A. G. B.

Mededeelingen van den Burgerlijkgeneeskundigen Dienst in Nederlandsch-Indië. 1922. Pt. 5. pp. 343-473. With 24 charts.—**Annual Report of the Civil Medical Service in the Netherlands East Indies for the Year 1920.**

From this long report, with its many details and tables, a few matters of general interest are noted. There were in this year 80 Government medical officers (presumably European) and 180 " Indian " doctors ; the qualified native nurses numbered 165. Many Europeans died from tuberculosis ; at Sourabaya one-fifth of the mortality was due to this cause. At Semarang 14·3 per cent. of deaths were due to malaria.

Of 172 Europeans who had sick leave to Europe, in 111 instances the cause was " psychoses and psychoneuroses," dysentery coming next with 13. Inland leave was granted to Europeans in 23 per cent. for

psychoses, 18 per cent. for malaria, 6·7 for venereal diseases; to natives, in 20·7 per cent. for malaria, 12·7 eye diseases, 11·5 tuberculosis and 10·9 venereal disease.

Of the deaths in four hospitals, 25 per cent. were for diseases of the respiratory system, 11·9 for tuberculosis, 10·1 for dysentery, malaria coming fifth with 7·8. The Government Vaccine Establishment is very active. Vaccine was sent out sufficient to vaccinate 9,673,000 persons. The total number of vaccinations was 1,157,000; of these 803,000 were controlled and 96·9 per cent. took, "which indeed may be called very good."

At the Pasteur Institute 756 persons bitten by rabid animals were treated.

An estimated 50–60 thousand patients received salvarsan for yaws, usually a single dose of 0·45 gm. The yaws incidence seems to vary much in different parts of the islands.

An epidemic of oedema disease was attributed to the fact that the oil mills often buy the whole coconut crop from the inhabitants, so that there is a shortage of fat.

At the hospital for eye diseases, Bandoeng, of 5,494 patients 2,440 suffered from trachoma.

An interesting account is given of the Government Medical School at Weltevreden. Medical instruction was first given in 1851 by army medical officers in the Malay language, and at first to supply vaccinators; but it was soon found that a more complete training was necessary. In 1875 the course was divided into a preparatory one of two years, and a medical of five, and Dutch was used. In 1881 the preparatory instruction was extended to three years. In 1902 a new establishment, accommodating 200 students was opened, and in 1903 the medical course was extended to six years. In 1913 a second medical school was established and another year added to the medical course. A table shows the subjects studied and the number of hours given to each. The pupils in the year under review numbered 250, of whom 17 were Europeans; 13 obtained the diploma. Many fail to qualify for the medical course, and of those that do many fall by the way.

The Government seeks to co-operate with plantation hospitals, either subsidizing them in exchange for accommodation, or handing over the management of Government hospitals in return for a rent or by joint ownership.

Propagandism is not neglected by this very efficient civil medical service. An adviser for medical propaganda entered upon his duties in the course of this year.

A. G. B.

DE BUEN (Sadí). **Nuevos datos para la distribución geográfica de algunas enfermedades parasitarias en España.** [The Geographical Distribution of Certain Parasitic Diseases in Spain.]—*Libro en honor de D. Santiago Ramón y Cajal.* 1922. Madrid. pp. 407–414. With 2 text figs. [8 refs.]

Accounts are given of a case of relapsing fever in a native of Berrocalejo in the Province of Cáceres, and seven cases of infantile kala azar—two from Villanueva de la Vera, two from Campo de Aranuelo, one from Talavera de la Vieja (all in the Province of Cáceres), and two from the adjacent Province of Toledo. Lastly, is recorded the case of a child of $4\frac{1}{2}$ years from Talayuela (Cáceres) with *Hymenolepis nana*, believed to be the first recorded there.

H. Harold Scott.

Lasnet. **Note au sujet de la valeur physique des contingents indigènes de l'armée du Rhin.**—*Ann. de Méd. et de Pharm. Colon.* Paris. 1922. May–June–July–Aug. Vol. 20. No. 2. pp. 161–175.

The Army of the Rhine for the last two years has included Algerians and Tunisians, Moroccans, Senegalese, Malagasies and Annamites. The average strength of the Algerians and Tunisians was 15,900, and of the Moroccans about 2,000; their sanitary state is good. The Moroccan recruits were superior to the European. The 6,000 Senegalese were withdrawn after six months of these observations. Their sanitary state was satisfactory. The pneumonia rate was only 5·25 per mille, but they had been already acclimatized in the south of France. The hygiene of the 2,000 Malagasies was good in the first year; in the second there was a sensible deterioration, the morbidity having risen from 171 per mille to 1,171; the causes were influenza and other respiratory affections and malaria. They were evidently not yet acclimatized. The 1,150 Annamites were well acclimatized.

Comparative figures are given for the European and the various extra-European contingents, showing the morbidity, mortality and repatriations for the two years both for general reasons and for individual diseases.

A. G. B.

Calcutta. **Annual Report of the Calcutta School of Tropical Medicine, Institute of Hygiene and the Carmichael Hospital for Tropical Diseases for the Year 1922.**—67 pp. [Megaw (J. W. D.), Director and Professor of Tropical Medicine] [Date and place of publication not stated.]

Knowles (R.). **The Calcutta School of Tropical Medicine and Its Programme for Research.**—*Proc. Assam Branch Brit. Med. Assoc. Ann. Meeting, Haflong.* 1923. Jan. 7. pp. 20–51.

From this first annual report of the Calcutta School of Tropical Medicine we learn, to begin with, how much the coming into existence of the school owes to the constancy and the persistent effort of Sir Leonard Rogers.

The school is now well established, with well-equipped buildings, an adequate hospital, a full staff of whole-time professors and assistants, a good contingent of research scholars, and a competent endowment. What it chiefly lacks is provision for that most fascinating and most promising of all the modern developments of biology, namely, the study of bio-chemistry in its application to tropical disease. A minor defect is that the teaching of helminthology has to be carried on by a professor whose attention is heavily engaged in studies which are not in particularly close interdependence with helminthology.

The reports of the several research scholars deal respectively with kala azar, hookworm, dysentery and other bowel diseases, leprosy, diabetes, and filariasis.

Attempts to discover a laboratory animal unreservedly susceptible to infection with kala azar have not been successful; a transient infection has sometimes been produced, a fact that suggests the necessity of some concurrent infection, or (as with elephantiasis in relation to filariasis) the necessity of repeated reinfection, for the complete establishment of the kala azar parasite. In the experimental treatment of kala azar antimony tartrates have given most satisfactory results, but stibenyl (10 cases) has proved unsatisfactory, besides being

dangerous. It has been observed that the slow intravenous injection of therapeutic doses of antimony tartrates does not, like sudden injection of larger doses, cause any remarkable fall of blood-pressure.

In experimental treatment of hookworm carbon tetrachloride, though very potent against the worm, often causes prolonged prostration, and sometimes intractable diarrhoea, when not given concomitantly with a purge (jalap). Chenopodium must be given to children with caution, and is contra-indicated in kala azar, but it can be taken by ordinary coolies without causing interruption of their work. Beta-naphthol acetate has proved most disappointing. Experiments on soil infestation in the open air lead to the conclusion that in Lower Bengal hookworm larvae cannot survive in the soil during the hot weather. In 1921 the reporter (Dr. J. B. McVail) observed that the ordinary septic tank does not destroy hookworm larvae ; he has now devised a tank fitted with baffle-plates and larva-trap which has proved to be nearly perfect against them. Attempts to infect pigs with human ancylostomes have been unsuccessful ; the pig, however, has an ancylostome of its own, the larvae of which perish in water in five days. Observations lead to the suspicion that during the rainy season the vital activity of hookworm in the intestine is increased. Observations on the blood show that concurrent malaria reduces, and concurrent kala azar almost abolishes the high eosinophilia which is characteristic of uncomplicated ankylostomiasis.

Investigation of dysentery has been carried on chiefly in the Bengal coalfields, where the majority of cases were bacillary. Here hookworm complicates the study of bowel diseases.

Experiments in the treatment of leprosy have been conducted with the esters of fatty acids of various non-saturated oils, particularly linseed oil. In the administration of oils the subcutaneous method is often the most effective, by direct effect on the bacillus. Investigation has been made of the lipase content of lepers' blood before and after treatment, to determine whether non-saturated fatty acids increase the lipase in the blood by their influence on the tissues. Attempts to transmit leprosy to monkeys have failed.

Preliminary researches in diabetes have been directed to the determination of normal blood-sugar content and normal urinary sugar of healthy Indians ; their blood-sugar content was found to vary from 0·08 to 0·15 per cent., and their urinary sugar to range between 0·06 and 0·15 per cent. Experiments on rabbits showed that sudden fright caused the blood-sugar content to shoot up to the extent of 50 per cent., and sometimes to nearly double the normal.

The researches of the Pharmacology and the Chemistry Departments have been directed largely towards the analysis of indigenous drugs. From *Lathyrus sativa* a specific substance having an amine base has been isolated, but not an alkaloid. *Boerhaavia diffusa* has been found to yield, besides an unusual amount of free potassium nitrate, an alkaloid having a diuretic effect.

Varied and interesting work has been done in the Pathology Department. Investigation of the action of Shiga bacillus in media rich in amino-acids showed that the bacillus could alter these into bases that had a marked effect on uterine muscle ; cholera vibrio in the same media was capable of forming bases that, when injected into rabbits, caused collapse and diarrhoea. The action of these bases is influenced by the hydrogen-ion concentration of the organs, and varies with the species of animal. Observations in acute amoebic dysentery showed that the stools, unlike those in bacillary dysentery, are acid ; this bears on

treatment, since emetine acts (*in vitro*) more powerfully (on infusoria) in a p H 8 than in a p H 7 medium. Experiments with the bases isolated from *Lathyrus sativa* showed that in guinea-pigs they paralyse the hind legs and cause a slight rise of blood-pressure.

In the Protozoology Department much study has been given to kala azar, malaria, and amoebic dysentery. Two cases of dermal infection by *Leishmania donovani* were observed, the lesions being soft granulomata quite unlike Oriental sore ; a monkey was inoculated into the skin and the infection " took " locally, after an incubation period of 22 days, but did not become general. Methodical examination of faeces of kala azar patients gave no clue to any imaginable elimination of the parasite by that route, not even in eggs of hookworm or Strongylus ; characteristic of the kala azar stools, however, was the abundance of yeasts present (57 per cent. of stools of 210 cases), sometimes in association with " cystic bodies " (probably aberrant yeasts). On the other hand, methodical examination of 442 blood-films from 140 kala azar patients disclosed parasites in 19 per cent. of cases and 12 per cent. of films ; and this is held as confirmation of the way of exit by some blood-sucking insect. Much inquiry was also made of the way of entrance of the parasite into man, but not with much success, unless an experiment upon a monkey, which Major KNOWLES lays some stress on, be taken as a finger-post. The monkey was fed upon fresh human spleen full of *L. donovani*, and was then given a drink of 30 cc. of the emulsified spleen ; the spleen being kept on ice, this meal was repeated next day ; about six months afterwards the creature became very ill, and, being then despatched with chloroform, was found to be massively infected—a " true fulminating kala azar." KNOWLES apologetically suggests as a " wild theory " that man may become infected by eating, dead or alive, the infected insect—or its faeces. [We beseech Major KNOWLES to gird up his loins and repeat this experiment. Did not DARWIN once say that he learnt most from what he called his " fool experiments " ?] In malaria search has been made for some shape or form explanatory of relapses. What has been confirmed in this search is that malaria parasites are destroyed in the spleen (in all cases of malaria with enlarged spleen the organ has been examined by puncture); and what is inferentially suggested by KNOWLES is that it is, so to speak, the business of the spleen to destroy malaria parasites and promote a spontaneous cure, and that if for any reason the spleen becomes obstructed in its work, the parasites get a respite and a relapse occurs. In connexion with amoebic dysentery investigations have been carried on to determine the p H environment of the different intestinal protozoa : with *Entamoeba histolytica* in the active phase (acute stage) the p H of the stools is constantly 6·3 ; in the inactive precystic and encysting phase the p H of the stools rises to 7·2–8·8 ; and when the attack is clearing up and Charcot-Leyden crystals appear the stools become very alkaline.

A. A.

DELAMARE (Gabriel). **Essai de classification et nomenclature des maladies exotiques.**— *Ann. de Méd.* 1922. Sept. Vol. 12. No. 3. pp. 245–256.

The author criticizes as illogical the arrangement of diseases in manuals of tropical medicine. The worst offenders are GRALL and CLARAC, and MENSE, but MANSON, and CASTELLANI and CHALMERS

are little better. The grouping is not a natural one. Stitt is commended for his arrangement—diseases caused by (1) protozoa, (2) bacteria, (3) filterable viruses, and (4) food deficiency and (5) helminthiasis, but he then falls off with (6) granulomata and (7) skin diseases, and the eighth group—diseases of unknown cause or small importance—contains such a heterogeneous collection as typhus, climatic bubo, ainhum, heat stroke, etc.

The author puts forward an etiological classification in tabular form with eight columns, the primary division being into diseases caused by physical agents, chemical agents, and living beings, and diseases of unknown origin. The third group is naturally much the biggest. The physical agent is heat. The chemical agents are poisons and vitamin deficiency. Skin diseases fall into their appropriate groups [an arrangement which has obvious clinical drawbacks]. He goes on to discuss in an interesting way the terminology of disease, which he classifies as anatomical (*e.g.*, ulcerating granuloma of the pudenda, etc.), physiological (*e.g.*, blackwater fever, etc.), clinical, etiological, geographical and historical. He notes that the etiological nomenclature has the disadvantage of depending on the botanists and zoologists. Thus thrush becomes, according to the view of the author, a saccharomycosis, a moniliasis or an oosporosis !

A. G. B.

Hewetson (W. M.). **Environmental Influences affecting Blondes in Rhodesia and their Bearing on the Future. A Survey of the Situation from the Medical and Scientific Standpoints. Being a Paper delivered before the Rhodesia Scientific Association, at Salisbury, May 15th, 1922.**—27 pp. Salisbury : The Rhodesia Independent Col., Ltd., P.O. Box 592. [Price 2*s.* 6*d.*]

By blondes the author means the Teutonic peoples of Northern Europe—English, Dutch, Germans and Norse. He describes the blonde invasion of the rest of the world, contrasting the slow progress of South Africa with that of the United States of America. If Rhodesia establishes herself as a permanent self-governing community in the Tropics, it will be the first instance of the blondes accomplishing that feat. In 30 years the country has acquired a population of some 34,000, not all blondes ; the birth-rate for the last year was 23·5 per 1,000, compared with 27 in England. The occurrence of blackwater fever is a deterrent to immigration, but " babies are the best immigrants." On the whole, Rhodesians are beyond the natural range of the species.

He goes on to consider climatic conditions—air movements, heat and light, especially the effects ot actinic rays. He suggests that the actinic rays have some intimate relation to the health of the red blood corpuscle, and apparently associates the outbreak of blackwater in the year of the lecture six weeks earlier than usual with the substitution of a dry and sunny for a wet January. He considers that in Rhodesia sun radiation is in excess. He protests vigorously against the corrugated iron which is apparently the usual roofing material in Rhodesia, and contrasts the difference in appearance of children from a thatched house and from an iron-roofed house. " We have carried the iron age too far." Among the remedies suggested for the climatic disabilities of Rhodesia are, the construction of houses to admit of sleeping in the open air, the addition of a storey to the usual type of bungalow " to avoid the midday heat from the earth and for better ventilation," the use of roofing material

that is non-heat-conducting, such as asbestos, the cutting of grass round houses instead of its removal, the use of sun spectacles to keep out excess of light and chemical rays; he regards this as of as much importance as suitable head-gear.

A. G. B.

SUNDSTROEM (E. S.). **Studies on the Adaptation of Albino Mice to an Artificially Produced Tropical Climate. I. Effect of the Various Factors composing a Tropical Climate on Growth and Fertility of Mice. II. Relation of the Body Form and Especially the Surface Area to the Reactions released by and the Resistance to a Tropical Climate. III. Effect of the Tropical Climate on Growth and Pigmentation of Hair and the Dependence of these Integumental Functions on the Temperature Coefficient Law. IV. Effect of Light and Heat on the Resistance of Mice to Acetonitrile. V. Effect of Humid Heat on the Blood Morphology of Mice.**—*Amer. Jl. Physiol.* 1922. Vol. 60. pp. 397–415. With 5 text figs. 416–424. With 2 text figs. 425–433; 434–442 and 443–447.

This series of papers is both instructive and suggestive. Such a review as is here possible will merely indicate some of the chief conclusions. The author is convinced that a considerable part of research in the climatological physiology of hot countries may with advantage be done in temperate climates on animals. The results may then be tested by anthropological observations in the Tropics.

i. His main object was to compare the growth of mice that either had been brought into a hot room at an early age—as a rule, at three weeks—or were born in that environment, with the growth of mice that were continously kept at ordinary room temperature; he studied also the rôle which such factors as light and circulation of air might play in adaptation to a tropical climate. The tropical room had an air capacity of $6\frac{1}{2}$ cu. metres, and was kept at a dry bulb temperature about 10° C. above that of the control room, the average in the hot room in two winter months being 31·8° (89° F.). The wet bulb reading for the same period was 27·9°. The source of light consisted of Mazda globes, two 60-watt lamps in the temperate room and a 100-watt lamp in the hot room. The results showed that the radiation from these, *per se*, was capable of producing physiological effects. About a thousand animals were used, some six to each cage; they were bred to the fourth generation. The growth studies were continued to the twentieth week.

The results are expressed in tables and curves. Exposure to artificial light at ordinary room temperature accelerated the growth of mice, especially those born in that environment. Confinement in the stagnant hot and humid atmosphere retarded the growth of mice that were transferred to the new environment immediately after separation from their mothers (at three weeks). Succeeding generations of mice born in the hot and humid environment behaved differently; the first generation may develop normally, the next two may show the greatest effect of the hot climate, at least, as far as growth is concerned. (The fourth generation was not observed beyond the seventh week.) A racial adaptation is suggested.

Exposure to artificial light in humid heat was found to add to the retarding effect on growth. Circulation of the hot and humid air neutralized in part the unfavourable character for growth of the tropical environment. [This is interesting in view of HUNTINGDON's views (see this *Bulletin*, Vol. 17, p. 345).]

The growth of male mice was less retarded by an unfavourable environment and more accelerated by growth-stimulating climatic factors than the growth of females. The author points to the well-known fact that women in the tropics suffer more from the heat than do men. The experience with the mice suggests that this may have a biological significance.

When the fertility of a mouse colony was normal it was not necessarily diminished by confinement in humid heat for four generations.

ii. The author finds that the ears of mice, and also the tail, may serve as auxiliary cooling organs in a hot climate. These parts of the body, as well as the scrotum, in his hot-room mice became greatly hyperaemic. SUMNER has observed that under these conditions the ears and tail may increase in length, thus changing the ratio body surface : weight in a favourable direction. Man, too, may possess some means of increasing his surface : weight ratio. He instances the slender type of the aboriginals in the tropics (height : weight ratio increasing, as does surface : weight ratio), and states that observations in Java on the height and weight of Dutch children show that the height : weight ratio increases considerably faster in Java than in Europe.

In the experiments the batches of mice were kept until two months old in the hot and cool rooms respectively. They were then killed, and weights and measurements were carefully recorded. The conclusions were reached that retardation of growth by enlargement of body surface area may in a tropical climate assist in combating the overheating of the body, and that animals may by enlargement of peripheral body parts, ears and tail, further improve their cooling mechanisms.

It was shown, moreover, that the mice so modified had acquired an enhanced resistance towards heat, for by accident the temperature of the hot room was allowed to rise to 39° for one night, and of the four survivors out of 23 all were mice, three of them males, which had undergone a retarded growth.

iii. Mice which were suddenly transferred from a hot to a cool environment responded quickly by a stimulated hair growth. Observations made on a man in the tropics suggested that hair growth is most rapid in a cool environment. The hair of recessive albino mice, when exposed to humid heat or to the radiation of strong light, acquired the power of producing pigment. It is suggested that the chemical processes that control the growth and pigmentation of hair may possess different temperature coefficients. The optimum temperature for pigment production appears to fall within the range of tropical heat.

iv. Since a retardation of growth may result from hyperthyroidism, the slow growth in the hot environment might have been caused by the presence in the blood of excessive amounts of the thyroid hormone, that is, by stimulation of thyroid activity. This possibility was tested by Hunt's acetonitrile reaction and was negatived.

It is suggested that tropical climate may—at least for mice—lessen the demand for thyroid hormone in the body.

v. The author is surprised that no attempts have been made to study the effect of humid heat on blood morphology by experiments on animals.

In 10 control mice the average red count was	..	10·14 million
In 16 mice exposed to heat since six weeks old	..	11·16 „
In 8 mice born in the hot environment	.. ..	12·10 „

" which seems to indicate that a progressive change in a positive direction takes place in the 'descendant' generations." The greater part of this rise is thought to be due to inspissation of blood.

The average white count in the control mice was 7,300 ; in the heat mice the number for "immigrants" was 6,880, gradually becoming less in the descendants, till in 25 of the fourth generation of heat mice it was 4,950. It is thought that this change is produced by high sensitivity to an increase of temperature of organs concerned in new formation of white blood-cells.

A. G. B.

Hill (Leonard) & Campbell (J. Argyll). **Heating of the Tissues of the Body by Light and Heat Rays.**—*Lancet.* 1923. Apr. 14. pp. 746-749. [9 refs.]

This paper, from the National Institute for Medical Research, Hampstead, is summarized by the authors thus :—

"1. Exposure of the whole body of a rabbit to the sun's rays at Hampstead rapidly increased the temperature of the deeper tissues, the fur temperature rising as high as 54° C.

"2. Exposure of the head and upper part of the body to the sun's rays was followed by a fall of temperature in the deeper tissues, the fur temperature in the sun not exceeding 46·5° C.

"3. Local exposure of the head of a rabbit to the carbon arc greatly increased the temperature under the scalp and in the brain, the fur temperature rising above 60° C. The body temperature—rectum—was often not greatly altered. The respiration was always very rapid—over 100 per minute.

"4. While recognizing fully that heat-stroke is usually due to a general raising of the body temperature, our results show that local heating may occur, and confirm the utility of pith helmets and spinal pads on exposure to tropical sun.

"5. Using the skin of the human knee and ordinary sources of rays—carbon arc and gas radiators—Sonne's results were confirmed—*i.e.*, luminous rays heat up the subcutaneous tissues to a greater degree than do non-luminous rays, the skin temperature being the same in both cases."

The temperatures were taken in some cases by placing delicate thermometers within the tissues, in others by using thermo-electric couples, mounted in hypodermic needles, connected with a differential galvanometer. In most instances the animals were anaesthetized with urethane. It is noted that the rabbit has no sweat glands, but the authors do not seem to think that this disability affects application of the results to man (para. 4 of summary).

A. G. B.

Polidori (V.). **Réactions de Gaté-Papacostas et de Hecht-Bauër dans le paludisme, la lèpre et le pian.**—*Bull. Soc. Méd.-Chirurg. Indochine.* 1922. Oct. Vol. 1. No. 1. pp. 49–54.

The author in Indo-China tested 614 serums, the majority from syphilis suspects, comparatively by the modified Hecht-Bauer and Gaté-Papacostas or formol-gel methods.

For 415 H.-B. positives there were 334 G.P. + and 81 G.P. − ;
,, 111 ,, negatives ,, ,, 56 ,, − and 52 ,, + ;
that is, a concordance of 80·5 per cent. in the positive cases and of 53·15 per cent. in the negative.

He thought that the formol-gel reaction might help him in the diagnosis of malaria, leprosy and yaws, and tried it in 5, 8 and 75 cases respectively, but for this purpose it was useless.

A. G. B.

CHATTERJI (Karuna K.). **Further Notes on Margosic Acid and Its Salts and Observations on their Clinical Use.**—*Indian Med. Gaz.* 1918. Oct. Vol. 53. pp. 377–380. With 6 plates & 3 charts. [Received June, 1923.]

Margosic acid is a mixture of the fatty acids of the oil derived from the seeds of the margosa (nîm) tree (*Azadirachta indica*). The sodium and potassium salts are soluble, and the latter is the better. Margosates added to an emulsion of washed human erythrocytes cause haemolysis, and experiments on this property are detailed. Though the margosates are but faintly antibacterial *in vitro*, they are strongly so *in vivo*. In syphilis they are effective in removing tertiary lesions, but less so with primary and secondary manifestations. For scabies, various forms of eczema, and psoriasis they possess curative properties; they are given both by injection and by local application. In septic cases due to pyogenic microbes they lead to improvement, and in cellulitis, erysipelas, sinuses, etc., the healing properties are remarkable. Short notes are given of 22 cases of primary and secondary syphilis thus treated, 16 of tertiary syphilis, 5 of hereditary syphilis, 14 of skin diseases and 4 of sepsis. Coloured plates illustrate the cure of psoriasis and of ulcers on the scrotum and leg. The cases appear to have received up to nine injections, but no details are given.

A. G. B.

i. KORTEWEG (P. C.). **Klinisch onderzoek over Euphysol chininum.** [Clinical Research on Euphysol chininum.]—*Nederl. Tijdschr. v. Geneesk.* 1922. Vol. 66. Pt. 2. No. 13. pp. 1384–1389.

ii. BIJLSMA (U. G.). **Pharmacologisch onderzoek van Euphysol chininum.** [Pharmacological Research on Euphysol chininum.]—*Ibid.* pp. 1390–1397. With 4 charts.

i. In "collobiase de quinine," produced by DAUSSE, Paris, according to the research of KOKS, quinine is kept in a colloidal state in combination with arabinic acid. Korteweg tested the effect of "Euphysol chininum," identical with the collobiase. Administration by the intravenous route of homeopathic doses, as recommended for the collobiase, failed to show any therapeutical effect in cases of sufferers from dementia paralytica artificially inoculated with benign tertian malaria [see this *Bulletin*, Vol. 19, p. 580]. A dose three times as high had no effect either. In administration *per os* the effect of Euphysol chininum corresponded with the amount of basic quinine contained in the new preparation (20 per cent.). Accordingly 2–3 gm. of the powdered drug had to be given to obtain a proper effect. Euphysol chininum, *i.e.*, collobiase de quinine, has no advantages above other salts of quinine.

ii. From the conclusions the following may be mentioned: The toxicity of Euphysol chininum (*i.e.*, collobiase de quinine), as well as its influence on blood pressure, respiration and temperature, and its haemolytic action, is in accordance with the percentage of basic quinine it contains. When injected hypodermically it is more readily absorbed than the hydrochloride, but it causes necrosis. Nothing was found which would justify the expectation of a particularly strong action of this preparation in malaria.

W. J. Bais.

Chopra (R. N.). **The Therapeutics of the Cinchona Alkaloids.**—*Indian Med. Gaz.* 1922. Nov. & Dec. Vol. 57. Nos. 11 & 12. pp. 401–406; 441–446. [18 refs.]

An interesting dissertation with, however, a sketchy historical introduction, where the famous Sir Clements Markham, whose name is perennially rooted in the beginnings of cinchona in India, is disguised as "Sir Robert Markham."

A. A.

Abe (Bungoro), Fukui (Shinritsu) & Imai (Idzumi). [**On Acidosis occurring among Stokers working in the Boiler Rooms of H.M.S. Iwate during the Voyage in the Tropics with Special Reference to its Prevention.**]—*Kaigun Gun-I-Kwai Zasshi* (*Bull. Nav. Med. Assoc.*). 1922. July. No. 36. [Summarized in *Japan Med. World.* Tokyo. 1922. Nov. 15. Vol. 2. No. 11. p. 329.]

The authors observed that acidosis, developing among the stokers working in the tropics, could be effectively prevented by sodium bicarbonate (1·0–3·0 gm.) in water either before or during work.

J. H. Tull Walsh.

i. Drummond (Jack Cecil) & Zilva (Sylvester Solomon), with Coward (Katharine Hope). **The Origin of the Vitamin A in Fish Oils and Fish Liver Oils.**—Reprinted from *Biochemical Jl.* 1922. Vol. 16. No. 4. pp. 518–522. [13 refs.]

ii. —— & ——. **The Preparation of Cod Liver Oil and the Effect of the Processes on the Vitamin Value of the Oils.**—Reprinted from *Jl. Soc. Chemical Industry.* 1922. Aug. 15. Vol. 41. No. 15. pp. 280t–284t. With 1 text fig.

i. The authors trace the origin of the vitamin A in fish oils and fish liver oils to the synthetic powers of the marine algae which form the fundamental food supply of all marine animals. Copepods, larval decapods and molluscs feed on these, and are themselves consumed by small fish, which form the food of the cod, haddock, etc.

ii. A study of the methods of preparation of cod-liver oil showed that the content in Vitamin A did not vary to any great extent with the process. Other fish livers seem to be as valuable as that of the cod, and the stearine, which is usually removed, is a valuable source of vitamin.

A. G. B.

i. Sharpe (W. Salisbury). **The Laryngeal Complications of Tropical Diseases.**—*Jl. Trop. Med. & Hyg.* 1922. Sept. 1. Vol. 25. No. 17. pp. 273–276.

ii. Read (B. E.). **Pharmacognostic Notes. (I) Chinese Materia Medica.**—*China Med. Jl.* 1922. July. Vol. 36. No. 4. pp. 303–305.

iii. Lewis (J.). **Some Observations on South African Toxicology.**—*S. African Med. Rec.* 1922. Sept. 23. Vol. 20. No. 18. pp. 350–352.

iv. Reynaud (G.). **Les médecins et les colonies: le crise médicale.**—*Presse Méd.* 1922. Oct. 14. Vol. 30. No. 82. pp. 1713–1715.

i. The "tropical" diseases of this article are leprosy, glanders, enteric fever, hydrophobia, syphilis, tuberculosis, gangosa, anthrax, leukaemia, trichiniasis, erysipelas, mycoses, foot-and-mouth disease. Reference is made also to leeches and intestinal parasites.

ii. The drugs or poisons discussed are *Illicium anisatum* and *religiosum*, *Hydnocarpus anthelmintica*, and *Datura alba* and *stramonium*.

iii. The poisons discussed, among others, are acocantherin, an arrow poison, and also used by the natives as a preventive of infection when eating meat of animals dead of anthrax; the juice of the larva of the beetle Diamphidia, a bushman arrow poison; and the shrubs Plumbago and Melianthus. Some details of extraction of the active principles are given.

iv. The "medical crisis" consists in the scarcity of doctors in the French Colonies, aggravated by the war. The author discusses the how and whence of their recruitment and their training. It seems that the young French doctor prefers a modest competence at home to the chances of an adventurous and responsible career in the tropics.

A. G. B.

i. Watson-Williams (P.). **Epididymitis in Malaria and Dysentery.** [Correspondence.]—*Lancet.* 1922. Oct. 28. p. 935.
ii. Smith (Henry). **Cholera or Dysentery.** [Correspondence.]—*Brit. Med. Jl.* 1922. Nov. 25. p. 1049.

i. A letter in which the writer asks for references to recorded instances of epididymitis due to malaria or dysentery.

ii. The writer asserts that cases he saw in Mesopotamia in 1916 under treatment for cholera were really suffering from bacillary dysentery, and that change of treatment saved lives.

A. G. B.

REVIEWS AND NOTICES.

SANGIORGI (G.). **Protozoi patogeni per l'uomo e per gli animali.**—Reprinted from "Trattato di anatomia patologica per medici e studenti. Pubblicato dal Prof. Pio FOA. Anatomia patologica generale." Part 8–9—pp. 81–149. With text 19 figs. & 2 plates. Unione Tipografico. Turin: Editrice Torinese (Gia Ditta Pomba).

In the narrow compass of 67 pages the author gives a general account of the Protozoa that are pathogenic to man and animals. So far as the more important parasites are concerned the account is in the main good, but elsewhere there is a general tendency to quote, as authentic, statements that are open to serious criticism.

Authorities will hardly agree that *Trypanosoma rhodesiense* is easily cultivated on blood agar, and that the cysts of *Entamoeba histolytica* are rare. The common carrier of canine piroplasmosis, *Rhipicephalus sanguineus*, is omitted. Among the Haemogregarines, which are defined as coccidia parasitic in the blood corpuscles, the various conjectured haemogregarines of man and monkeys are included without reserve, and the figure in plate 2 of an organism there specified as *Leucocytogregarina cuniculi* is probably a vegetable cell. Furthermore, it may be pointed out that *Hepatozoon*, not Leucocytogregarina, is the correct generic name for the mammalian haemogregarines. The author does not mention the coprozoic Protozoa as such, but records as definitely parasitic such coprozoic forms as Bodo, Prowazekia (which is really a synonym of Bodo), Cercomonas, Toxobodo, and Pirobodo. His *Toxobodo intestinalis* is certainly a species of Spiromonas common in old faeces, and his *Pirobodo intestinalis* is probably a coprozoic flagellate of the genus *Heteromila*. His *Waskia intestinalis* should now be known as Embadomonas. The Toxoplasmata receive attention, but of two species mentioned—*T. musculi* and *T. ratti*—it is impossible to tell from the figures what they represent. In the account of Coccidia the human *Isospora* is called *I. bigemina*, and is inaccurately figured; the schizogony stages, which the author claims to have discovered in the urine, are also figured, although there is no proof that the structures in question actually are stages of this parasite. The ciliata are briefly described and the statement is made, without any qualification, that species of Colpoda, Chilodon, and Uronema have been recorded from man.

C. M. Wenyon.

VAN DER WALLE (Nicolaas). **Over de Aanwezigheid van Vitaminen in Urine.** [The Presence of Vitamins in Urine.] M.D. Thesis, Utrecht.—86 pp. With 1 plate & 9 figs. 1922. Amsterdam: M. J. Portielje, Spuistraat 249.

From his experiments on polyneuritic pigeons, which he fed with slightly concentrated human urine, GAGLIO, of Rome, came to the conclusion that urine contains non-specific excretion products possessing a function analogous to FUNK's vitamins. His assistant, CURATOLO, who, using rabbit urine, successfully repeated these experiments, came to the same conclusion and found that urine had even a more powerful effect than the vitamins which FUNK had isolated from yeast.

On the other hand, FUNK had shown before that some purin and pyrinidine derivatives exert a favourable action on polyneuritis. EIJKMAN too has pointed out that temporary curative action on polyneuritis does not warrant the acceptance of the presence of vitamins, and he and VAN HOOGENHUYZE have demonstrated that a mixture of NaCl and KCl favourably influence this disease for a short time. Still more striking is the communication of THEILER, of Pretoria, who got some good results by the injection of ·3 cc. of distilled water. The results of these latter investigations were only very transitory, in great contrast to those of CURATOLO, who states that he had been able to keep pigeons in "the

most perfect health" for two months by giving them 5 cc. of rabbit urine per day.

The author of the communication under review has endeavoured to solve the question whether the favourable results obtained by Gaglio and his co-operators could be explained by (*a*) the presence in the urine of a beneficial mixture of organic and inorganic substances, or (*b*) by the presence, as first suggested by Muckenfuss, of vitamins in urine as well as in bile, saliva, etc. A second series of experiments was undertaken to ascertain whether possibly some definitely anti-scorbutic vitamins were excreted with the urine. The details of the experiments should be read in the original paper; suffice it here to mention some of the more important conclusions: (1) Fresh human urine administered in sufficient quantity has a favourable effect on polyneuritis, as has (2) fresh urine which has been desiccated at 37° C. for 16 hours, when administered *per os*, whereas the subcutaneous administration has no effect at all; (3) urine heated at 130° C. for one hour loses its effect; (4) the inorganic salts contained in the urine play a minor part in the therapeutic effect; (5) animal charcoal, which does not itself affect polyneuritis, absorbs the active substances from the urine and renders them ineffective; (6) similar results were obtained with dog's urine as long as the dog was fed on food containing sufficient vitamins, but when the dog was kept on a vitamin-free diet its urine lost its curative properties; (7) as a rule pigeons responded much better to this treatment than fowls; (8) lastly, the author found that urine did not contain any antiscorbutic properties at all.

T. Joekes.

Martini (E.). **Lehrbuch der medizinischen Entomologie.** [Textbook of Medical Entomology.]—pp. xvi + 462. With 244 figs. 1923. Jena: Verlag von Gustav Fischer.

In the method of its presentation medical entomology is pre-eminently one of those subjects in which logical formality should be sacrificed to convenience, since in its rational application to medicine—or, rather, to hygiene—what is chiefly required from entomology is, not an academic scheme, but a judicious selection of apposite entomological fact. The author of the present volume, although giving verbal assent to the commonsense view that medical entomology is a subordinate branch of medicine, proceeds to treat the subject with formal precision, in five main sections and a plenitude of subsections, as an independent self-subsistent branch of zoology. Undoubtedly he has collected a great and miscellaneous array of facts, but those of an entomological kind are so much dissipated among extraneous detail, as to disparage their value to the medical man, however much they may interest or instruct the merely curious reader. The first section, of 64 pages, contains an account of the anatomical structure of Arthropoda, exemplified by *Anopheles bifurcatus* in all its phases; also a classification of the phylum, the technical austerity of which is, however, copiously relieved by figures of the different types; this classification takes us, in the case of the orders of medical importance, as far as families. The second section, which deals in 23 pages with venomous Arthropoda, includes some light freight on antitoxins, immunity, anaphylaxis, etc. The third section, of 175 pages, is mostly entomology: it includes the bionomy and taxonomy (as far as genera) of the several orders of "parasitic" Arthropoda, among which are included not only lice, bugs, fleas, ticks, mites, and certain flies, but also all the free-living flies that suck blood, and it also includes methods of destroying the different kinds of parasites. The distinction—so important in its practical bearing—between true parasites, like lice and bed bugs, which, by their necessary dependence on man, are completely at the mercy of the sanitarian's devices, and the merely predatory species, like Anopheles mosquitoes and tsetse-flies, that lead a free life in nature and can be subdued only by fundamental changes in the human social environment, is entirely ignored. The fourth section is entitled "Arthropoda as transmitters of

disease" : it contains a lot of miscellaneous entomology (including further instalments of the taxonomy of Culicidae, fleas and ticks) associated with great masses of inspissated helminthology, protozoology, and bacteriology ; for the author catalogues his arthropod carriers according to the class of organisms that they foster or transmit, and provides separate sections in which each such class—worms, sporozoa, amoebae, flagellates, spirochaetes, unknown (probably filterable) viruses, and bacteria—forms the subject of a separate treatise. The fifth and final section, of 24 pages, deals with contrivances for the destruction of noxious insects, mechanical means, heat, fumigation and contact poisons almost monopolizing attention.

A. Alcock.

CHOYCE (C. C.) [C.M.G., C.B.E., M.D., F.R.C.S., Director of the Surgical Unit, University College Hospital Medical School, etc.] & BEATTIE (J. Martin) [M.D., C.M., Professor of Bacteriology in the University of Liverpool, etc.] (Pathological Editor). [Edited by.] **A System of Surgery.** Second Edition. In Three Volumes. Vol. I. pp. xxiii + 1013. With 19 colour and 58 half-tone plates & 245 figs. in text. Vol. II. pp. xv + 1057. With 20 colour and 10 half-tone plates & 336 figs. in text. Vol. III. pp. xvi + 1176. With 11 colour and 30 half-tone plates & 329 figs. in text. 1923. London, New York, Toronto and Melbourne : Cassell & Company, Ltd. [Price £6 net per set.]

Mr. Choyce is to be congratulated on the appearance of the second edition of his System of Surgery, the preparation and publication of which have been delayed for some years by war and post-war conditions. In view of all that has happened since the last volume of the first edition was published, it is good to discover few serious gaps in the original list of distinguished contributors. It has been necessary, however, to find new writers for several articles, while all of the remainder, as the editor informs us in his preface, have been thoroughly revised. Material additions have in many cases been made and 150 new illustrations, including 50 plates, inserted. The arrangement adopted in the first edition has been adhered to, surgical pathology and general surgery being dealt with in Volume I and surgical affections of the various regions and organs systematically described in Volumes II and III. Professor J. M. Beattie again collaborates as pathological editor. Military surgery being now regarded as too large a subject for inclusion, gunshot wounds are noticed only with regard to their bearing on civil surgery. Diseases of the eye and most of the cutaneous affections are not dealt with, and for details of operative procedure readers are referred to the standard works on operative surgery.

Consisting as it does of a series of thoroughly up-to-date articles from the pens of selected contributors specially qualified to deal with the various branches of its subject in their rapidly changing aspects, the book is an invaluable one alike from the student's and from the practitioner's point of view. Its reputation has already been established and its utility more than proved.

In the short space at his disposal, it is the intention of the reviewer merely to touch lightly upon points in some of the sections likely to prove of special interest to the tropical practitioner, or the student proposing to adopt a tropical career.

To surgeons in many parts of the tropics and sub-tropics, called upon as they frequently are in out-of-the-way localities to operate without the aid of a skilled anaesthetist, the articles on Local Anaesthesia and Spinal Analgesia should prove of great assistance. The former is by Dr. Gwynne WILLIAMS and Dr. F. S. ROOD, and the latter, a specially valuable contribution, by Mr. Lawrie MCGAVIN and Dr. ROOD. The agents most commonly used and recommended for the induction of spinal analgesia are tropacocain, stovaine, and novocain. Combination with preparations

of suprarenal gland is held to be contra-indicated as being probably dangerous to the vitality of the cornual cells of the cord. Applicability and contra-indications are duly considered, advantages and disadvantages weighed, and a full description of the technique of the method given. Post-operative phenomena and possible dangers are detailed.

The contribution by Dr. C. W. DANIELS and Dr. G. C. Low on Yaws, Tropical Sore, Leprosy, Madura Foot, and Granuloma of the Pudenda is an excellent one as far as it goes, but occupies only 17 pages inclusive of illustrations. Considering the great importance of more than one of these subjects, further space might well have been allotted.

The article by Col. J. W. WEST on Tetanus, still sometimes a dangerous factor in tropical surgery, will well repay perusal and study. The advantages of the intra-thecal method of antitoxin administration in declared tetanus are emphasized. In discussing prophylaxis the author refers to the extremely important and perhaps not generally realized fact that antitetanic serum, being only an antitoxin, does not lead to the elimination of the tetanus bacillus from the body, and that, in consequence of the universal prophylaxis resorted to during the war, carriers of the disease have multiplied, and cases of tetanus arisen after operation in the subjects of old war wounds. In such individuals it is very necessary, before operation, to produce immunity by an injection of antitoxin either subcutaneous, intramuscular or intravenous.

Professor F. C. MADDEN, of Cairo, treats of surgical diseases caused by animal parasites, snake bites and scorpion stings, myiasis, and poison wounds inflicted by fish. Most of his space is devoted to Schistosomiasis and Filariasis and their surgical aspects, whilst the lesions produced by the guinea-worms are also described. The student will find in this section ample material for study and assimilation, and this can be supplemented in the case of the more advanced practitioner by reference to standard works quoted in an appended bibliography.

On the subject of Elephantiasis of the Breast Mr. Sampson HANDLEY, in his article on diseases of that organ, mentions recent work by DUFOUGERÉ, FOULERTON and himself, tending to prove that elephantiasis depends upon a chronic infection by the *Staphylococcus pyogenes albus* and recommends that in the earlier stages a vaccine of this organism should be tried with a view to the possibility of arresting the disease. Tropical pathologists will doubtless be interested to hear more with regard to this work.

In an instructive article on the Spleen Sir Charles GORDON-WATSON refers to movable, wandering or ectopic spleen. This is a condition far from uncommon in India, where, when met with, it is usually associated with malarial enlargement. It doubtless occurs as frequently in other malarious countries. He mentions also two cases of splenic abscess reported from South China in which the *Entamoeba histolytica* had been found; similar cases have been encountered in India and successfully treated by aspiration and emetine.

Mr. Lawrie MCGAVIN's article on Hernia is revised by Mr. Choyce. Bassini's operation is the one favoured for radical cure, and the author wisely deprecates the present day custom of discharging patients from hospital 14–21 days after operation as a directly predisposing cause of recurrence.

Writing on Tropical or Amoebic Abscess of the Liver, Mr. G. Grey TURNER, who deals with diseases of that organ and of the pancreas, makes the curious statement that the white races, especially males over 40, furnish 90 per cent. of the cases. No surgeon or physician of tropical experience, whose work has included both white and coloured races, is likely to accept that figure as showing any approximation to accuracy, though it may be taken that the relative liability—obviously a very different matter—of the European soldier in the tropics (incidentally a man considerably under 40 in ordinary times) and the native soldier, man for man, is more than 9 to 1. Mr. Grey TURNER notes that many successful results have been reported from repeated aspirations combined

with energetic treatment by emetine. As a matter of fact a single aspiration is very frequently sufficient in this method, the procedure of which is by comparison so safe and simple, and the results so satisfactory, that it is difficult to understand on what grounds the author has formed his opinion that for surgeons with no special experience of this class of case the more formidable open operation is probably the best. Figures furnished by ROGERS, in his Lettsomian lectures of 1922, and by many independent contributors to tropical medical literature, all point in the opposite direction.

In the course of his contribution on the Male Genital Tract, Mr. Russell HOWARD refers to lymph scrotum as the forerunner of elephantiasis, and states that it is hardly necessary to separate the two conditions. Such a view is a mistaken one. Lymph scrotum is the name applied to a lymphangiectasis of the superficial scrotal lymphatics, usually of filarial origin. It is a local condition, but practically always only part of a more generalized lymphatic varicosity. The condition is by no means a necessary stage in the development of scrotal elephantiasis, and only in a proportion of cases does lymph scrotum pass into a state of true elephantiasis.

Many other sections of the work have been read with equal interest and profit. Where the standard is so high there is no room for criticism. The reviewer, like most surgeons whose experience has been acquired in India, has been denied personal practical acquaintance with non-traumatic aneurisms and their treatment and, perhaps for this reason, has derived special pleasure from perusal of the latter part of Mr. Rock CARLING's able and well-informed article on the cardio-vascular system.

The volumes, though substantial, are of convenient size, well printed on paper of the most satisfactory quality and in good legible type. The illustrations are numerous and excellent, many of the colour plates being of exceptional merit. No typographical errors obtrude themselves upon the reader's notice.

J. J. Pratt.

The Practice of Medicine in the Tropics. By many Authorities. Volume 3. Edited by BYAM (W.) [O.B.E.; Lieut.-Colonel, Royal Army Medical Corps (retired); etc.] and ARCHIBALD (R. G.) [D.S.O., M.D. Edin.; Major, Royal Army Medical Corps (retired); Director of the Wellcome Tropical Research Laboratories, Sudan Government, Gordon College, Khartoum; etc.]—xx + 1685–2550 pp. & index. Figs. 581–929; plates 67–96. 1923. London: Oxford Medical Publications. Henry Frowde and Hodder & Stoughton. [Price £4 4*s*.]

Section XIII.—*Disorders of Metabolism* (pp. 1983–2061).

Section XIII deals with the disorders of metabolism and is divided into three chapters on diabetes, the deficiency diseases and pellagra respectively.

In the preface to this work the authors state "our book has been planned to include articles on diseases which are not peculiar to warm countries but which present aspects of importance to practitioners in the tropics." This is evidently their excuse for including Diabetes in this section. A sufficiently detailed account of the disease and its modern treatment is given by Lt.-Col. E. E. WATERS, but it is difficult to see why it was included at all when such admirable monographs and articles are within easy reach of practitioners in the tropics. The only purely tropical features which the reviewer could discover were four in number, viz., ants are attracted by diabetic urine and this may cause the patient to seek advice; starvation in the East is more easily carried out than among Westerns; the rigid Hindu is very difficult to diet because he will eat neither meat, fish nor eggs; the inclusion in the diet tables of certain eastern vegetables. The author of this chapter has accomplished a difficult task with credit, no easy matter when new discoveries are of almost daily occurrence.

Under the heading deficiency diseases are included Scurvy, Beriberi and Epidemic Dropsy. The account of these diseases by Dr. Edward B. VEDDER is most interesting and leaves little room for adverse criticism. Scurvy in particular is described with the touch of a master. The chapter concludes with a summary of our knowledge of vitamins and of their distribution in nature. Support is given to the view that dry beriberi is caused by deficiency of the antineuritic vitamin, while wet beriberi and epidemic dropsy are due to the absence of another vitamin, as yet unnamed.

That Pellagra has not been classified among the food deficiency diseases is scientifically a correct attitude, though there can be but little doubt that at no very distant date the deficiency factor will be proved. The magnificent work of GOLDBERGER in America and WILSON in Egypt goes far in this direction. The theory that the disease is an infection is lightly passed over by Dr. George B. NILES, and SAMBON's simulium hypothesis is not even mentioned. Maize is no longer blamed more than any other carbohydrate as an etiological factor.

It is remarkable that in the section dealing with morbid anatomy great notice is taken of the changes in the sympathetic ganglia (which changes it is admitted have not been proved in all cases nor has it been shown that they do not occur in other diseases), while the well-marked condition known as central neuritis is not mentioned at all. The symptoms can best be explained by the statement that pellagra is a trophoneuresis with skin, alimentary and nervous manifestations. Careful criteria are given by which the disease can be diagnosed and the most important of these discussed as to their relative value in diagnosis. Full directions for treatment are laid down under the headings dietetic, hygienic, medicinal and climatic. The photographic plates illustrating this chapter are particularly good.

A. D. Bigland.

Section XVI.—*Skin Diseases* (pp. 2321–2470).

Sub-Section A.—*Tropical Skin Diseases* [pp. 2321–2452. With 8 plates and 57 figs.] [By CASTELLANI (A.) & CHALMERS (A. J.).]

In determining to make no reference to those skin diseases of cosmopolitan distribution, as encountered in tropical countries, the joint authors of this section have intentionally limited in our opinion the usefulness of their contribution. The subsection on Tropical Dermatomycoses forms naturally a very large portion of the treatise and is described in the masterly manner to be expected of these authorities. Their classification of dermatomycoses, based on the anatomical sites of infection, forms a comprehensive schema, while the mycological differentiation is somewhat too detailed for a non-mycologist to appreciate. Worthy of mention is the occurrence of an ectotrichophyton, in addition to the epidermophyton, as the casual parasite of T. cruris. It is to be noted also that the endodermophyton in cases of T. imbricata may affect the nails, while it does not invade the hair follicles. The condition Pinta is fully described, as are also Maduromycosis and Blastomycosis ; the account of this last-named infection is of perhaps greatest interest to dermatologists in temperate countries. Among the Dermatobacterioses reference is made to the presence of diphtheroid bacilli in veld sore and the successful treatment of this condition by antidiphtheritic serum. In the lengthy description of Leishmaniasis (cutaneous) there is no mention made of the tuberculoid or lupoid form ; attention is drawn to the occurrence of a vesiculopustular dermatitis following the administration of antimony. The group of tropical dermatoses of unknown causation includes many conditions under a corresponding number of headings. The differential diagnosis contained in the description of several of these dermatoses, unaccompanied by illustrations, is not in some cases very convincing.

Sub-Section B.—*Scabies* [pp. 2452–2470. With 6 figs.] [By MUNRO (J. W.).]

An interesting account is given of the life-history of the acarus. The writer maintains that the cause of the irritation occurring in scabies, as well as the formation of vesicles in the neighbourhood of the burrows, is the secretion of an acrid fluid by the acarus, and is not due to the wandering of the larvae or nymphae on the skin.

W. Jenkins Oliver.